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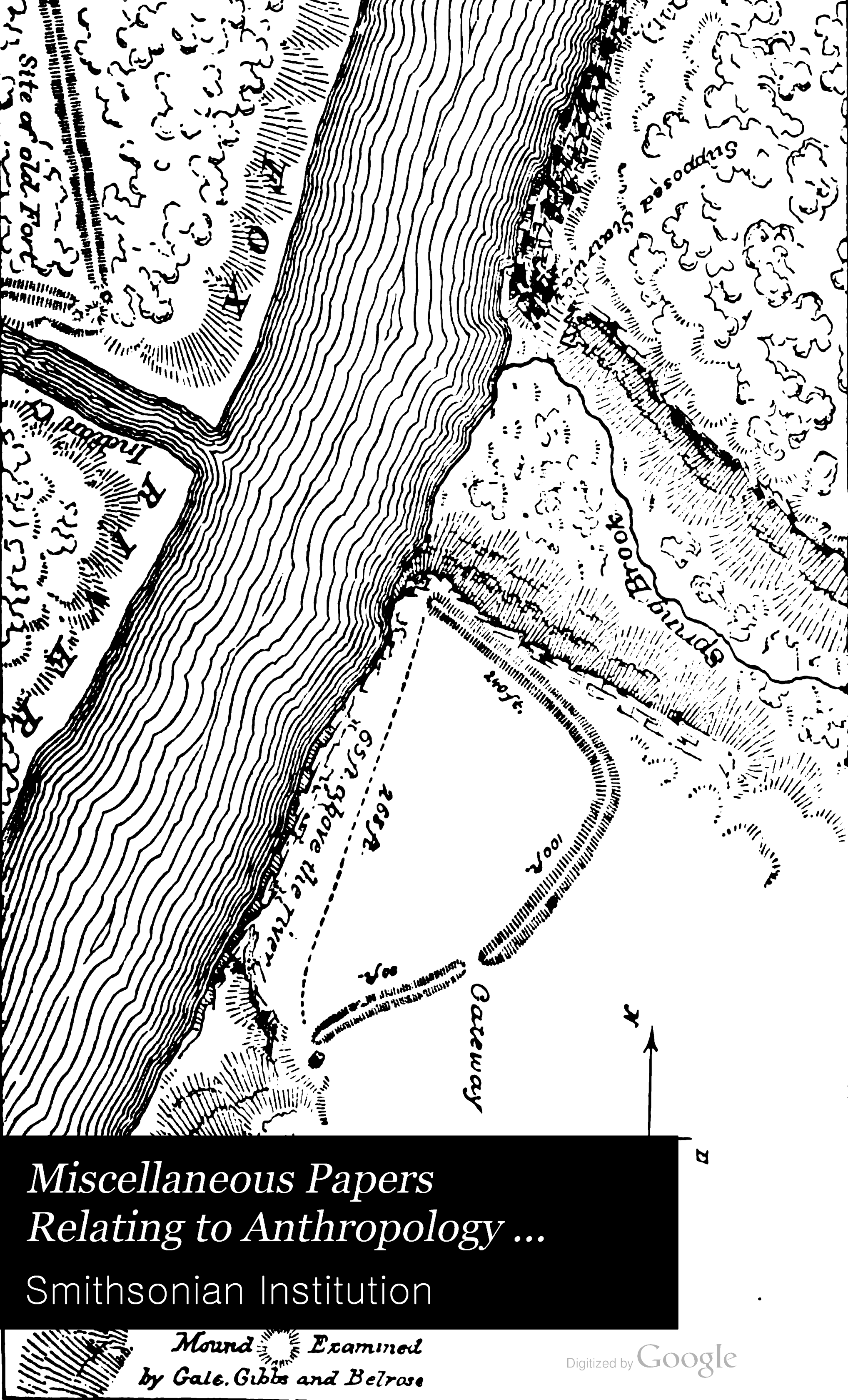

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RELATING TO

ANTHROPOLOGY.

PREPARED UNDER THE DIRECTION
OF
PROF. OTIS T. MASON.

FROM THE SMITHSONIAN REPORT FOR 1881.

WASHINGTON:
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1883.

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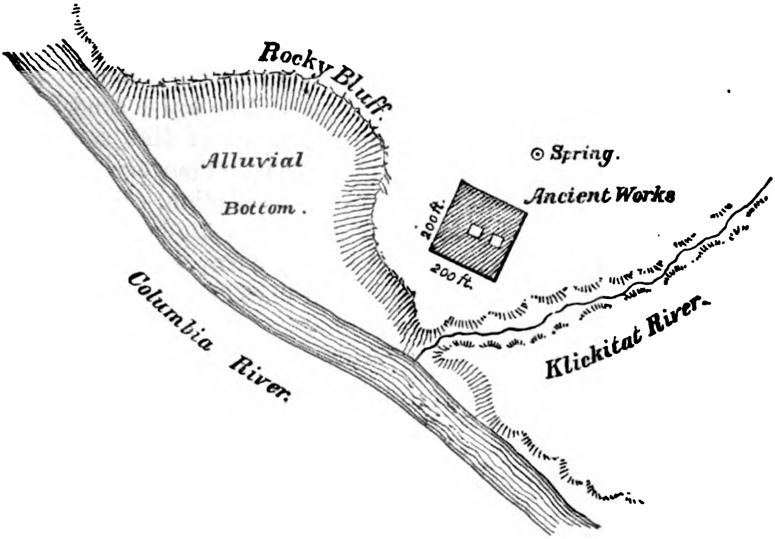
MISCELLANEOUS PAPERS RELATING TO ANTHROPOLOGY.

ABORIGINAL WORKS AT THE MOUTH OF THE KLIKITAT RIVER, WASHINGTON TERRITORY.

By T. M. Whitcomb.

The works represented in the accompanying sketch consist of a stone wall 5 feet high, filled inside with earth, except the two squares within. These are 8 feet deep and 15 feet on each side, the whole work being about 200 feet on either side. There was formerly some kind of wooden structure on the stone wall, as the remains of cedar timbers occur at certain points on the top. The wooden work was evidently destroyed by fire, since all the cedar is charred.



None of the Indians in this country have any knowledge of the builders or of its use. There is a tradition among them that it was finished a long time ago. Large quantities of arrow-heads are found in and about the works. The place is eminently adapted for defense, being 100 feet above the river. The scarcity of aboriginal works of apermanent character on the Pacific coast makes this an object of peculiar interest to the archæologist.

MOUNDS NEAR EDWARDSVILLE, WYANDOTTE COUNTY, KANSAS.

BY E. F. SERVISS, *of Wyandotte City, Kansas.*

On the farm of William Kouns, on the Kansas Pacific Railroad, near Edwardsville, Wyandotte County, Kansas, 14 miles west of this city, there are four mounds that have never been explored. They are situated on the third terrace of the valley of the Kansas River, about one-half mile from it, near a small creek. There is a very large spring about 200 yards northeast, and a smaller one about 300 yards northwest. On approaching the mounds from the east we find them extending in a straight line in a due westerly direction. They are about 6 feet in height, 25 feet in diameter, about 50 feet from each other at the base, and of uniform size. They have been somewhat injured by cultivation, the ground having been plowed twice. The soil is a black loam. Before the clearing of the land the mounds were covered with a heavy growth of timber, principally oak, and the stumps now remaining would indicate great age, averaging from 3 to 4 feet in diameter. A large number of axes, celts, arrow-heads, and other implements have been found in the immediate vicinity of the mounds.

About two years ago I discovered on the farm of J. L. Stockton, 1 mile northwest of this city, remains of an aboriginal workshop or village. It is located on a small stream, called Jersey Creek, and near a large spring. It covers an area of about 2 acres. The soil is sandy, and to the depth of 2 feet is a complete mixture of flakes of flint, ashes, bones (both animal and human), fragments of ornamented pottery, broken and unfinished stone implements of nearly every description. The fragments of pottery are the most numerous; there are three kinds as to color; viz, black, brown, and red, composed of a mixture of clay, sand, and pounded shells. The variety of the combinations of lines and dots is inexhaustible. I have never found two pieces alike.

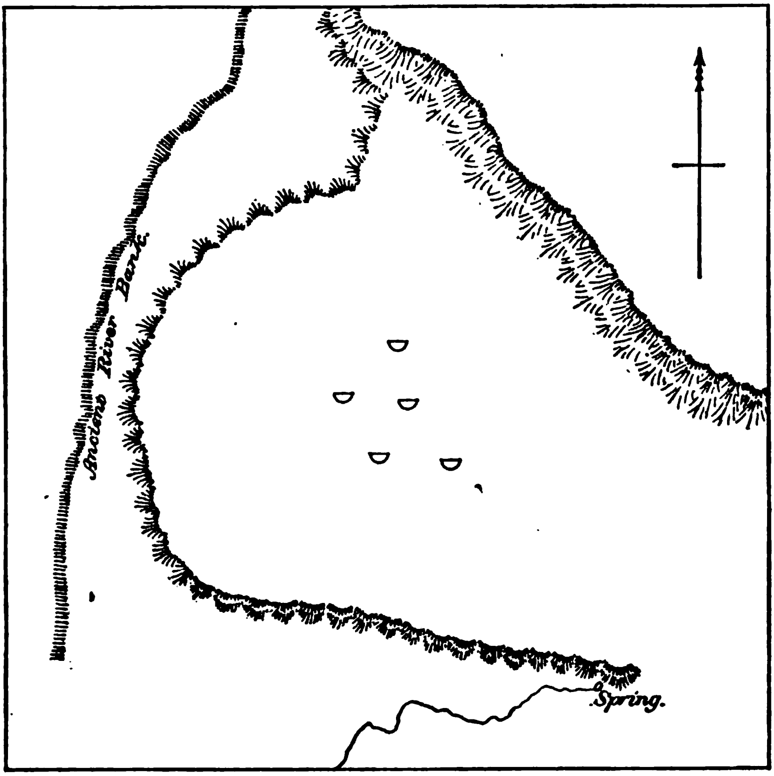
Judging from the degrees of curvature of the fragments, the original vessels were mostly globular, and would hold from one-half pint to one quart. I found a very small vessel, containing powdered bone or lime; it was globular in shape, would hold about one gill, and was profusely ornamented. There are no deposits of flint and other stone valuable for arrow-making, &c., in this vicinity. The axes, celts, skin-dressers, and balls are all made of porphyry, and the arrow-heads of flint.

ANTIQUITIES OF MILLS COUNTY, IOWA.

BY SETH DEAN, *of Glenwood, Iowa.*

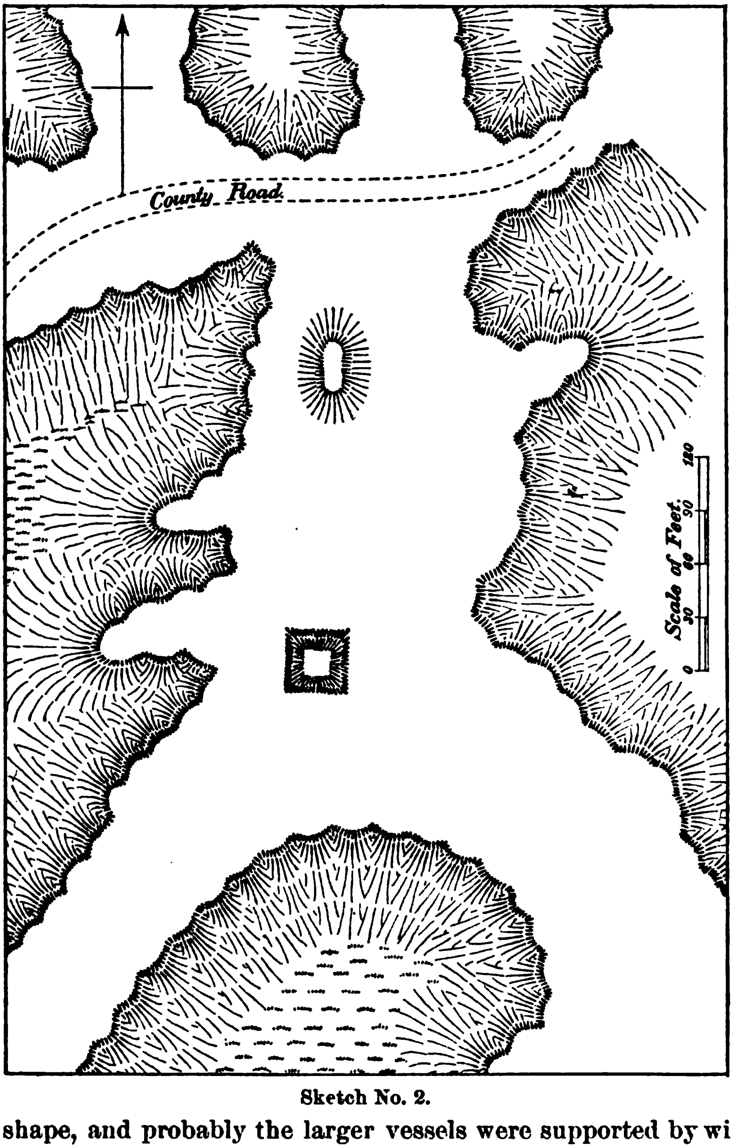
Mills County is located on the extreme western boundary of Iowa, and is the second county from the southern boundary. Immediately prior to its settlement by the whites it was the home of the Pottawatomie

Indians, numerous traces of whom may still be seen, but the two places to which this article refers seem to have an earlier date. The sketch marked No. 1 is a point in the southeast corner of the southwest quarter section 8, township 73 north, range 43 west of the fifth principal meridian, and on the lands now owned and cultivated by Mr. O. E. Allis. Topographically considered it is located on a spur of the bluffs which form the eastern boundary of the great Missouri flood plain, and is perhaps 50 feet above the level of the plain. The remains at present consist of a number of circular depressions on the southwestern slope, but near the summit of the aforesaid point of bluff. To the south about 400 feet there is at present a deep ravine, from which flows an excellent spring of water, while east and north the range of bluffs rise to a height of 250 feet above the plain. The depressions are from 20 to 30 feet in diameter, of circular form, and at present are from 1½ to 2 feet deep, but as the ground has been in cultivation for a number of years, it is probable that they have been filled up considerably.



Sketch No 1.

The ground on the site and for some distance around these hollows is strewn with small chips of stone and fragments of pottery, together with occasional tools of various kinds, such as arrow-heads, knives, &c. Also a number of pieces of different-colored paints and occasional ornaments have been found. The inhabitants seem to have understood the manufacture of pottery to some extent, as numerous fragments show. The clay for this they obtained in the bank near at hand. This was probably mixed with the lime of powdered clam-shells, and then molded into shape, and probably the larger vessels were supported by wicker-work made from small twigs, as there are numerous specimens which seem to show such an arrangement, although no perfect vessels have been found here, nor is it certain whether the vessels were baked in the fire or not.



Sketch No. 2.

The writer thinks the inhabitants lived mostly upon the products from the water, as the shells of the fresh-water clam are numerous, and were obtained from the Missouri River, which at that time probably flowed along the foot of the bluff, at their very door.

The stone for their implements seems to have been obtained in part from some ledges near here, and perhaps some of it from a distance, as the finer and more perfect of their tools were made from a kind not found here, except in the form of pebbles or drift bowlders, all the native stone being a carboniferous limestone, with the exception of a very coarse flint which is met with in some localities, and which was used for the larger tools, but which apparently was not suitable for smaller implements. Chalcedony seems to have been used by them to some extent, as were other kinds of stone of which the writer does not know the name. Some of these tools show superior skill, and have been apparently first chipped into shape and then ground to a perfectly smooth surface. This is the case with some hatchets which have been found, also of a globular stone which the writer has in his collection, and which was probably used as a sling-shot or for a similar purpose.

Sketch No. 2 shows the location of a peculiar mound, which is situated on the summit of one of the highest of the range of bluffs which borders the Missouri River flood plain. It is near the northwest corner of the northwest quarter of the southeast quarter section 10, township 72 north, range 43 west of the fifth principal meridian, and is about 5½ miles south and 2 miles east from No. 1.

This bluff is nearly 300 feet above the lowlands, and overlooks the country for many miles in every direction. The mound in question was formed of the soil adjacent, and is at the present time about 8 feet in height above the original surface. The base of the mound is elliptical in form, being about 70 feet north and south, and 40 feet east and west. The earth from which this mound was made was apparently taken from a place 125 feet south, where a large depression exists, about 35 feet square, and at present 5 feet deep. There is the stump of a burr-oak tree 16 inches in diameter standing near the northwest corner of the pit, on the edge of the slope of the bank; also another burr-oak stump 14 inches in diameter near the southeast corner, which is also on the bank, but at the edge of the excavation. This mound was partially opened some twenty-five years ago, but without yielding anything of consequence. My note-book shows the following entry: "Opened mound with S. B. Proudfit, November 25, 1879, and dug a hole 6 feet long and 4 feet wide. At 7 feet from the surface came to a layer of ashes about one-half an inch thick, and below this a layer of stones. These stones were from 2 to 11 inches thick and would probably weigh from 20 to 30 pounds. They were evidently placed on what was the original surface of the ground, and the ashes and earth placed above them. The stones were probably brought from the Nebraska side of the Missouri River. About 4 miles directly west the characteristic fossils in the stones indicate this. There did not seem to have been any action of fire on the stones, so far as we could discover, neither were there any bones or implements found in the mound, although we dug down 3 feet below the layer of stone. There were a few chips of flint found on the ground around the base of the mound, and a large stone implement which the writer thinks may have been used for a hoe, but belonged to a later tribe than the one which built the mound." (See Fig. 1.) Two cemeteries are also found in the county, but no examination has as yet been made.

DESCRIPTION OF MOUNDS AT SNAKE DEN, NEAR SALEM, HENRY COUNTY, IOWA.

By W. V. Banta and John Garretson, *of Salem, Iowa.*

There are many unexplored mounds in Henry County, Iowa. The group examined and here described are 3 miles west of Salem, in section 22, on land owned by Mr. Joel Jones, at a place known as the Snake Den.

1. The first one in the group is 8 feet high, and 20 feet in diameter. It was opened by the authors, but nothing of value was discovered within. A burr-oak 26 inches in diameter was growing on the summit. The land slopes gradually westward to Little Cedar Creek.

2. Sixty feet from No. 1 occurs a burial mound nearly level with the surrounding surface and 20 feet across. It is covered with flat rocks. (A large quantity of bones of all sizes were encountered, but none of them were whole, and some appear to have been burned.)

3. No. 3 is 60 feet from No. 2. It is 3 feet high. It was not very thoroughly opened. In it was found one body, lying at length, between flag-stones, the head toward the north. The bones were badly decayed.

4. This mound is the usual distance from the last mentioned. Indeed, to avoid repetition, it is a remarkable fact that each of the mounds in this row is just 60 feet from the preceding. This mound was 3 feet high and 20 feet in diameter. It was but partially opened, and three skeletons were found, badly decayed, lying at length, the heads to the north.

5. The fifth mound in the series is 5 feet high and 20 feet in diameter. The top was covered with smooth, flat rocks, arranged in the shape of an elongated hexagon or coffin lid, with stones set edgewise around the border. Five feet beneath the top, that is, on a level with the natural surface, two bodies were lying at full length, the heads toward the north.

6. The sixth mound was not opened. It is 30 feet in diameter and 5 feet high.

7. The next in order, No. 7, is also 5 feet high and 20 feet in diameter. It was only partially explored, revealing a few human bones. On the top there are two trees growing, one of them 2 feet in diameter.

8. No. 8 is 5 feet high and 30 feet in diameter. It had been opened

previously to the visit of the authors. It is said to have contained a stone vault, in which were discovered human crania, &c. These were very badly decayed. A sandstone mortar and arrow-points were also found. The burial seems to have been in a sitting posture.

9. The first eight mounds are in a right line, but No. 9 is 60 feet east of No. 8. It was 5 feet high, and yielded nothing upon exploration.

MOUNDS IN RALLS COUNTY, MISSOURI.

By George L. Hardy and Fred. B. Scheetz, *of Monroe, Mo.*

The only ancient remains in Ralls County, so far as known to the writers, are what are commonly called mounds. They are located on Salt River, a western tributary of the Mississippi, passing through townships 55 and 56, in ranges 5, 6, and 7 west of the fifth prime meridian.

The mounds are invariably found within less than a mile of a stream affording a permanent water supply. They are always in the bottoms or on the crests of bluffs and ridges, bordered either by the streams or the bottom lands, mostly by the latter.

It is impossible to state what changes have taken place in the course of the streams since the erection of the mounds, but doubtless in some places they have been very great. The growth of timber is universally the same on the mounds and in the surrounding forests.

Occasionally a single one is found, but they are almost invariably in groups, numbering from 3 to 10, and sometimes more. Commonly they follow the crest of the ridge, but when they occur in the bottoms or on a level bluff they are found in direct lines or in gentle curves, extending generally east and west. They exist in large numbers in almost every bottom and on nearly every bluff, on both sides of the river, throughout the entire county, as well as on its branches near the main stream.

The mounds are usually circular in ground plan, and rise above the present level from 2 to 12 feet. They are composed either wholly of earth, wholly of stone, or of the two combined. Where stone was used at all, the plan seems to have been first to pave the natural surface with flat stones in one or two thicknesses for a foundation. In one case the stones were thrown together indiscriminately. Peculiar constructions will be more fully noted in the descriptions given below of mounds examined by the present writers.

The stones were procured from the beds of the neighboring streams or from beneath the bluffs. Rarely can it be determined whence the earth was taken, there being only one example where there was any indication of the removal of the earth in the vicinity.

Human remains are almost invariably met with, only one exception being noted. The bones are generally very much decayed, though each bone is found almost entire, except those of the head. This seems to have always rested on a stone, and to have been covered by one or more, so that it is always found in a crushed condition. In stature the skeletons indicate a variation from 5 to 6 feet. No jaw-bone or even a fragment of one has been found from which the teeth were missing, and of the scores of teeth recovered there has been but one decayed, a wisdom tooth still in place. The teeth invariably indicate mature or advanced age. The human remains found in mounds constructed wholly of stone are generally much more decayed than those in mounds of mixed material. In rare instances stone implements, pipes, &c., are taken from the excavations, but these are more frequently picked up on the surface at no great distance from the remains.

So far as known, no accounts have been published concerning these mounds, nor have any systematic examinations been made.

As the stones used in their construction were of a kind useful to the early settlers in walling up their wells, laying foundations, building chimneys, &c., nearly all such material has been removed, so that it is rare to find a mound that has not been disturbed to some extent.

Since all the bottom lands are now in cultivation, those in such locations have been plowed down for many years. But where they are tolerably large and built principally of stone, as is generally the case, they are still well defined. Those that are situated on timber lands have the same growth of trees upon them as in the surrounding forests, if they are composed wholly of earth. In some cases white-oaks 2 feet in diameter or more are found on the very summit as well as on the slopes.

In the southeast quarter section 6, township 55, range 5, owned by Mr. J. Brashear, on the right bank of Salt River, is a row of mounds on the top of the bluff, which rises precipitously and then slopes back to the interior. There are twelve of them, the three southern ones being in a cultivated field, the others in the native woods. They vary in distance from 20 to 70 yards and in size from 20 to 50 feet in diameter, and in height from 2 to 5 or 6 feet. Except the south one they are of mixed material. That was wholly of stone, which was mainly removed by Mr. Brashear some forty years ago, when he commenced his improvements. He found in it a single human skeleton of large size. The fourth from the south was examined by us a few weeks ago by digging a ditch about 3 feet wide through its center. It is 58 feet in base diameter, and at the center 5½ feet above the general surface, having several white oaks growing upon it as large as any in the woods. The base was of flat limestone, thrown together without order; above this a layer of earth, another of stone, and so on to the top. No relics were found except a small fragment of pottery, a portion of a globular-shaped vessel, the inside of which was coated with a greasy soot, which smutted one's hand like lamp smoke. This was found about 3 feet below the surface. Many such fragments have been, and some can still be, found on the field before spoken of. There was no indication of any decayed substance anywhere to be detected, nor of any action of fire, except on some of the limestones, which had evidently occurred before they were placed in the mound. The earth in this mound appears to have been taken from a portion of the field about 160 yards distant.

Southeast of the house of Mr. Robert M. Spalding, in the southeast quarter section 36, township 56, range 6, about 1 mile from the left bank of the river is a row of mounds, the western one of which was composed of stone of a peculiar color, only found in the vicinity on the right bank of the river at the distance of nearly 1 mile.

On the southeast quarter section 35, township 56, range 6, we opened a mound, one of several on the top of the ridge. On the south side of it the bed stone had been formed into a shallow trough. On removing the flat stones which covered this, and which showed no action of fire, we found a bed of charcoal several inches thick, both animal and vegetable, and the limestone which composed it was burned completely through. Some fragments of a human femur were found in a calcined state. There was no indication of fire elsewhere in the mound, but there were the partial remains of several skeletons, lying in two layers, with stone and earth between them. The implements marked with Mr. Spalding's initials were found in his vicinity, and are sent by him.

On the west half of the southwest quarter section 4, township 55, range 6 west, owned by Mr. Utterback, a row of mounds, four in number, is found, commencing on the brow of the bluff and extending back in nearly a westerly direction, in a slight curve for about 250 yards, at irregular distances. The eastern one is much the largest. The others are all in a field which has been cultivated for thirty years. One was examined and opened. Fragments of human bones were found on the surface, thrown up by the plow. On the north and south sides single skeletons were found, laid at length east and west, and between the two a confused mass of bones, as though a number of bodies had been thrown together indiscriminately. The diameter of this mound was about 30 feet, its height about 2½ feet above the general surface. It was composed of earth and stones.

On the northeast corner of section 8, township 55, range 6 west, owned now by W. Keithley, a mound was opened by one of the present writers (G. L. H.) in 1853. It was on the brow of the bluff, about 50 feet in base diameter, and at the center 5 to 6 feet high, and made wholly of stone; near the middle lay a single skeleton, indicating a person 6 feet 4 inches in height. It was extended at full length, with head to the west. A dry wall was laid up around the remains 1½ feet high, and this covered with large flat stone, on which the remainder were thrown indiscriminately.

Near the northwest corner of section 18, township 55, range 6 west, is an isolated conical hill, called the "Round Knob." Its crest is a narrow ridge about 150 yards long, on which are four mounds. The northern one was much the largest, and forty years ago portions of a dry wall still were standing, 4 to 5 feet in height. Human remains were found in all these mounds.

In section 24, northeast quarter, township 55, range 7, and on the opposite side (the left) of the river, is a similar but smaller hill, called "Wilson's Knob." Its crest is about 120 feet long, completely covered with stone to the depth of several feet, the pile being about 20 feet wide. On examination, made recently, it was found to have been originally a row of burial-places, nine in number, circular in form, each from 8 to 9 feet in diameter (inner measure), contiguous to each other. The remains of the walls still stand to the height of about 20 inches. Judging from appearances, it would seem that each had been of a conical or dome-like form. They were composed wholly of stone, and the remains found in them were almost wholly decomposed.

On the top of an opposite ridge to the west is another row, four in number, similar to those just described, except that the cists are square instead of circular, the sides being equal to the diameter of the former. In these also only small fragments of bones could be found. These last have been examined within a few days.

On the left bank of the river, about 1 mile below the "Round Knob" above referred to, are what are known as "The Painted Rocks," a number of rough representations of the human figure, about 20 inches in height. They are drawn on the face of the bluff, which overhangs so as to afford almost complete protection from the weather. This bluff rises 180 to 200 feet above the bed of the stream, and these drawings are 60 or 70 feet below the top. At the foot of the bluff are large masses of fallen rock and earth, filling up between the river and the bluff, and rising within 30 feet of the drawings. The central human figure is somewhat larger than the others, who are represented as approaching him in Indian file.

A single mound was found on the northwest corner of the southwest quarter section 12, township 55, range 7, on the point of a secondary ridge, near a small northern tributary of Salt River. It contained two skeletons, one with the head east, the other west. Beneath one of these a trench had been dug and filled up with stone, on which flat stone had been laid, and on which last the body had been placed.

MOUNDS IN THE SOUTHERN PART OF PIKE COUNTY, MISSOURI.

By Joseph C. Watkins, *of Ashley, Mo.*

There are mounds in this section known as "Indian graves." The time of their construction antedates the settlement of this section by the whites. Some of the oldest citizens suppose that the mounds were the burial places of the Sacs and Foxes, but they say the mounds appeared as old when they first came here, sixty years ago, as they do now. I have found no one who ever saw or heard of the construction of one of these mounds. There are no other indications of a former occupation of this region by the aborigines that I have ever seen. The mounds visited by me are located in the southern part of Pike County, Missouri, as follows:

One mound on the land of L. M. Wells, southwest corner of the northwest quarter section 34, township 52, range 3 west, about 1½ miles southwest of Ashley; one on what is known as the "House Land," about the center of the southwest quarter section 28, township 52, range 3 west, about 2 miles west-southwest of Ashley; one on the land of James Farquar, northwest corner of the northeast quarter of the northwest quarter section 10, township 51, range 3 west; three on the land of E. G. Collins, near the southwest corner of section 16, and about 1 mile southeast of New Hartford; two on the land of Benjamin Young, northwest corner of the northwest quarter section 24, township 51, range 3 west; three on the land of John Motley, near the southeast corner of section 24, township 51, range 3 west, and near the junction of the creeks North Cuivre and Indian, and nearest the post-office of Louisville, Lincoln County, Missouri; two on the Coperhaver farm (now occupied by Nunc Estis), about 2½ miles south of Louisville, Lincoln County, Missouri.

All the mounds in question are situated on high points of land, forming bluffs to the creeks Cuivre and Indian. At the foot of the bluffs are good springs. Back from the bluffs the surface is undulating and tillable.

Three of the mounds are isolated, six in groups of threes, and four in groups of twos. All the mounds are circular. They are composed of soil and rock, some with the dirt and rock alternating, some of clay, with vaults of rock in the center. In the center of some there are rectangular vaults containing remains and soil. The material was probably obtained near by—the rock from the ravines and the soil from the banks of the same. Eight of the mounds have been partially explored—all of the Collins group, both of the Benjamin Young group, and Nos. 1 and 2 of the Motley group; also one of the isolated mounds on L. M. Wells' land.

In No. 1 of the Collins group the remains of two skeletons were found, with some fragments of pottery. In No. 2 of same, in a rectangular vault, 4 by 5 feet, were found the remains of eight skeletons, with a few pieces of pottery. In No. 3 of same, a vault made of flat rocks, in the shape of a coffin, containing a few pieces of cranial bones, very much decayed. In No. 2 of the Young group nothing was found. In No. 1 of same, a large vault, the dimensions of which we did not have time to determine, contained human remains, much decayed, among which were found three flint arrow-heads, a small vessel molded of clay and burnt, and a pipe carved out of steatite, having upon its front a figure-head. In No. 1 of the Motley group bones were found, and among them a piece of pottery which shows some attempt at ornamentation, and a peculiar rock, oblate-ellipsoidal in form, with depressions (central) on its opposite sides. Around these depressions are 36 marks, arranged in groups of threes. All seem to have been diminished in altitude by continued exposure to the elements.

Trees were growing upon all the mounds, but some of them have been cleared. On the apex of No. 1 of the Motley group an oak tree had grown 22 inches in diameter, but was blown down, and now lies in the last stages of decay. Large oak and hickory trees have grown upon the other mounds.

ANCIENT ROCK INSCRIPTIONS IN JOHNSON COUNTY, ARKANSAS.

By Edward Green, *of Clarksville, Ark.*

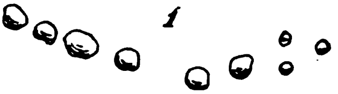
Five miles north of Clarksville, Johnson County, Arkansas, in section 7, township 10 north, range 23 west, is situated a cavern, or rock house, as it is commonly called, rather remarkable for its shape and the inscriptions on its walls. This cavern is in the southern side of a solid mass of sandstone that crops out on the crest of a hill, which rises some 200 feet above a small stream that flows by its southern base.

The cavern presents the appearance of having been worn out by the action of running water in some remote geological period, and in shape approximates a quarter section of a sphere. It is about 50 feet wide, 25 feet deep, extending into the rock, and about 10 feet high.

A partition, or rather two pillars of rock, descending from the dome or roof to the floor, divides the cavern into two chambers, of which the western, or left-hand one as you enter, is three or four times as large as the other. This partition divides the entrance into two semicircular apertures, which, together with the high, bold, and retreating mass of rock above, give it the appearance of an enormous skull buried to the orbits in the earth. This, together with a peculiar resonance produced whenever the floor is forcibly struck, must have caused this place to be held in reverence and awe by the superstitious aborigines. The cavern is somewhat difficult of access, and could have been easily defended in time of war.

On the walls of the larger chamber curious characters have been cut into the rock to a depth varying from one-fourth to one-half inch, by some blunt instrument in the hands of an unskillful sculptor.

Upon my last visit to this interesting spot, with the assistance of Mr. C. E. Robinson, of Clarksville, Ark., I succeeded in tracing these characters on paper, which I afterward reduced to one-sixth the size of the originals, by means of the *camera lucida*, thus preserving their true outlines and proportions; a traced copy of which accompanies this article.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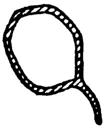
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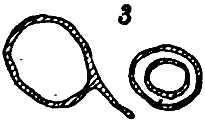
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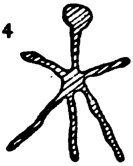
Fig. 1 represents hemispherical depressions or holes in the floor of the cavern, near the left entrance and a few inches from the wall. They are arranged in an arc-shaped row, with concave side to the wall.

Fig. 2 and the first character in Fig. 3, which occur above Fig. 1, on the wall, are incised circles, each 7 inches in diameter, and have each a single ray pointing downward and to the right. The other character of Fig. 3 consists of two concentric circles, the outer one measuring 5½ inches in diameter, and the inner one 3 inches.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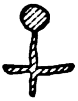
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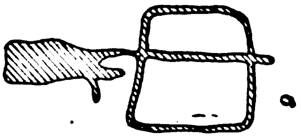
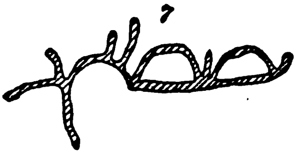


Figs. 4, 5, and 6 occur to the right and at about the same height as Fig. 3. Fig. 4 measures from top to bottom 11½ inches; Fig. 5, 7 inches, and Fig. 6, 23 inches.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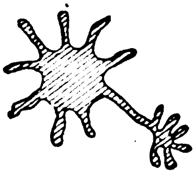
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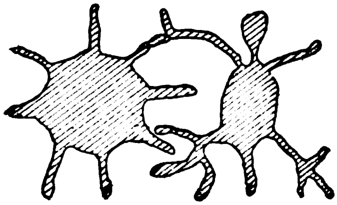
Fig. 7 is a double character. The one on the left may represent the antler of a stag, the other a bow. The whole figure from left to right measures 23½ inches.

Fig. 8 is a rayed character with a circular body chiseled out to the depth of the rays, viz, one-fourth inch. The body of this figure is 4½ inches in diameter, and the length of its rays about 2½ inches. One of the rays connects with a similar but smaller figure.

Fig 9 is also a double figure; the first character is like Fig. 8, but larger and has one ray less. The body of this figure measures 7½ inches in diameter, and the length of the rays from 2 to 3 inches. The second character represents some reptile, as the tortoise, and measures from head to tip of tail 13 inches. The bodies of these figures, like Fig. 8, are cut to the depth of one-fourth to one-half inch.

9



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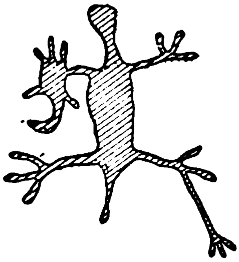
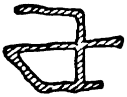


Fig. 10 is another double object and might have been intended by the unskillful sculptor to represent a lizard with its prey or young. The smaller figure is reversed. The larger figure, from head to tip of tail, measures 15 inches; the smaller one, 7 inches.

To the right of the characters represented in Fig. 10 are two characters, Figs. 11 and 12, which are somewhat confused, and were difficult to trace, as they are surrounded by a multitude of indistinct lines and cuts. The sculptor had perhaps spoiled his figure and tried to obliterate it.

11



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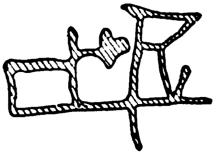

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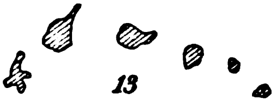
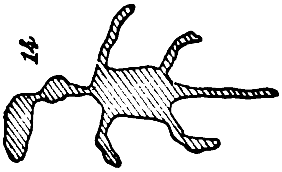


Fig. 13 are small irregular depressions in the wall of the cavern, to the right of the character represented by Fig. 14.

14



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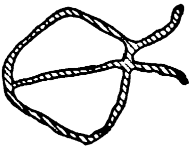

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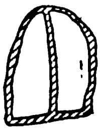

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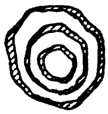


Fig. 14 is another reptile, with a peculiar swell on the neck and an elongated head. The length of this figure, from head to tip of tail, is 19½ inches.

Figs. 15 and 16 occur still further to the right, and appear to be of a more recent period, and cut with a better instrument or by a more skillful sculptor.

In the rock floor of the smaller chamber is a round hole 19 inches in depth and 7½ inches in diameter at the top, and about 4 inches at the bottom; probably used for a mortar by the ancient cave-dwellers.

On the roof or dome there are several figures, as represented by Fig. 17, that have been painted on the surface of the rock and are now faded to a pale gray.

I found no spiral figures of any kind here, which occur so frequently among inscriptions of this character in other localities.

No stone implements of any kind, except a few broken pieces of arrowheads, have been found in the vicinity of this cavern.

The sculptured characters here described are undoubtedly of ancient origin, and the only ones that have been discovered in Johnson County. However, I have been informed that similar inscriptions occur in Newton and Carroll Counties, of this State.

MOUNDS AND OTHER REMAINS IN INDEPENDENCE COUNTY, ARKANSAS.

By A. Jones, M. D., *of Caddo Gap, Ark.*

In the fork of White and Beach Rivers, Independence County, Arkansas, is a collection of mounds 2 or 3 miles each way in extent. They are 4 or 5 feet high, and laid out in rows in a semicircular form, about 6 miles above Jackson.

There is another group south of Suspension Rock, half a mile south, laid out in the same way.

On section 17, township 5 south, range 21 west, are two mounds 7 or 8 feet high, sunken at the top. Near by are depressions whence the earth for the mounds was taken. These have never been explored. They are on a piece of upland that has been cultivated and each had large trees growing on the summit. They stand about 2 miles from the Caddo River. There are two shell-beds near by, constructed of the common mussel, in which the coarse clay and shell pottery is found.

Four miles north of Amity, section 17, township 5 south, range 23 west, are several shell-heaps on a high and second bottom of the Caddo, entirely above overflow.

Another mound is in the Caddo Cove, 2 miles west of Black Springs, on the old Major Farr place, now owned by Dr. Gray. It is 5 feet high and has been explored. A depression 80 yards distant is the only spot in the vicinity whence the material of the tumulus could have been derived.

There are several shell-heaps on a high table-land bordering on the

Washita, in this county, 4 miles southwest of Cedar Glades, on the land of Robert Hansley. Fragments of pottery occur about the heaps. The beds are 40 feet above high water, indicating that the shells must have been carried to the spot.

On the south fork of Washita, section 24, township 2 south, range 26 west, near Mount Ida and at the upper ford of the creek, human remains, partly washed out, were discovered. The bodies were buried in a recumbent posture, the head to the west. The bones were too friable for preservation, the teeth alone remain firm. Forty years ago the ground was covered with a dense growth of cane. The bottom is a high one and above overflow. Many human remains have been plowed up in the vicinity. The cemetery must be about 200 to 300 yards long, and 75 yards wide. Near by, running east and west, are severals small mounds, in the largest of which a former owner, Mr. Powell, was buried.

Three miles east of this point, in a bottom-land owned by Reuben McKenney, were plowed up the remains of a very large man. Pottery has also been found in the same vicinity.

On section 9, township 4 south, range 24 west, is an outcrop of novaculite or flint of a very tough quality and of various colors. From this material large quantities of arrow-heads, &c., have been formed. The ancient artisans went down on the south side of the outcrop, which is a ledge 700 or 800 feet above the adjacent valley, and carried away immense quantities. The material is the same as that of arrow-heads from Tennessee, Mississippi, and westward.

There is on Capt. R. S. Burk's farm, section 17, township 5 south, range 23 west, evidence of an extensive workshop in arrow-heads and cutting implements. The arrow material was taken from the quarry above described, although ten miles away. The cutting instruments were of the hatchet kind and made from a species of iron ore. There is another *atelier* near my home, section 7, township 4 south, range 24 west, Montgomery County, Arkansas.

MOUNDS NEAR THE NATIONAL HOME, MILWAUKEE COUNTY, WISCONSIN.

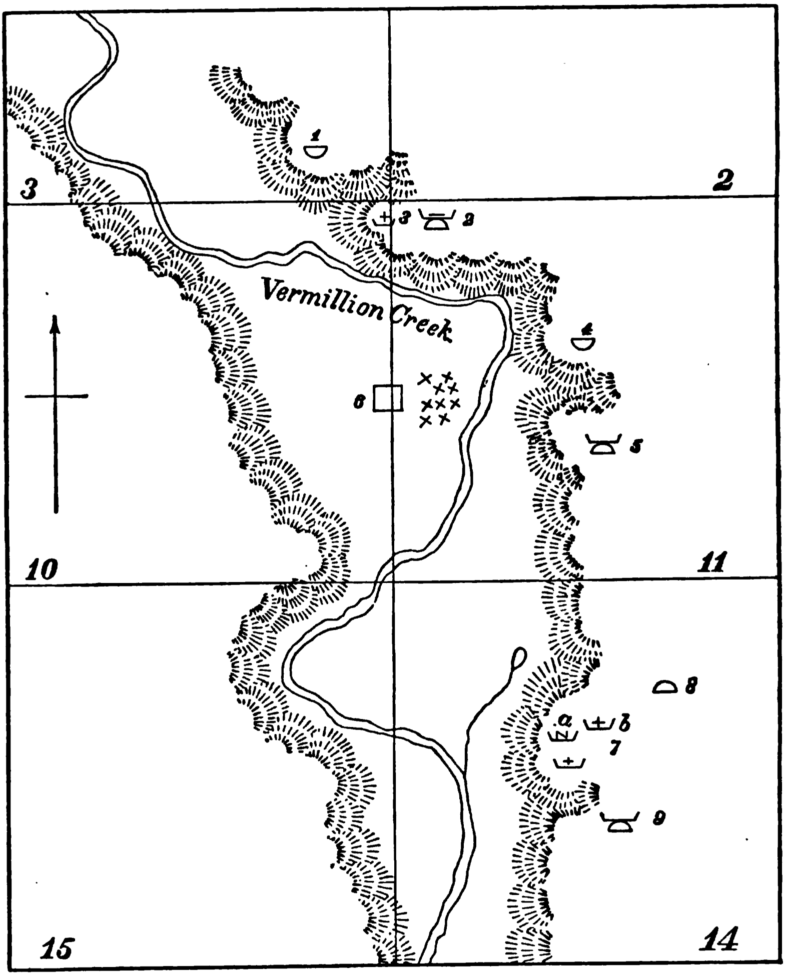
By George W. Barber, *of the National Home, Wisconsin.*

The mounds described in this paper are on land owned by Joseph Carey, nearly opposite the Dewy place (adjoining John R. Goodrich's farm), now occupied by E. P. Bacon. They are about one mile west of Milwaukee City limits, on the south side of National Home avenue, and on the west side of the Trowbridge road. The two that have been removed were upon land owned by William Trowbridge, lying south of and adjoining Carey's land. Two are in Wauwatosa township, two in Greenfield, and all are in Milwaukee County, Wisconsin. They are situated upon a swell of land from 20 to 100 rods distant from what was once a shallow pond or lake. The land occupied by the lake has been partially drained within a few years, and is now a meadow. The surface around the mounds is covered with soil from 12 to 18 inches deep, and might have been used for cultivation. William S. Trowbridge and other old settlers have said that there are, or were a few years ago, hillocks or marks of Indian cornfields in this vicinity, and that they have seen Indian corn growing, planted by the Indians. The land to the west has been partially drained. There is no apparent arrangement of the materials. The center of the mound is not different from other parts. The material was probably obtained around the mound, as the soil is deeper under it than at its sides. All have been explored. I have taken bones from two of them, and have been told that pottery and bones were found in the other two. I have one good skull from No. 2, and leg bones, vertebræ, ribs, &c., from No. 1. No account of these mounds has ever been published, to my knowledge. Nos. 3 and 4 have been entirely obliterated for purposes of cultivation. No. 2 has been dug into. No. 1 is fast being undermined to obtain gravel for the streets of Milwaukee. For two years past I have watched with sad interest the destruction of this grand old monument of a decayed race, and secured the bones as they were exposed. It now presents a perpendicular section, running nearly through the center, of which a photograph might easily be taken. A maple and a red-oak tree grew upon the mound, each 18 inches in diameter. There are two red-oak stumps within two or three rods of No. 1, 3 feet across the shorter, and 3½ feet across the longer diameter. Judging from the soil around them, these trees must have grown since the mound was built. I have counted the annual rings of growth of one, and found them to number 155. I assisted in taking out of No. 1 the fragments of three skulls, and other bones of three skeletons. The skulls, vertebræ, and hip-bones of each skeleton were on about the same level, and in a space not more than 15 inches square. In one case the crown of the skull was downward, and the top on a level with the hip-bones. This position at first puzzled me, but I suppose that the body was buried in a sitting posture, and the superincumbent weight of the earth, as it settled and the flesh decayed, turned the top of the head downward by the side of the body, and it continued to descend until it reached the level of the hips. The faces, judging from the position of the legs, were toward the west. The bodies were not inclosed. One skull was quite well preserved, but the other bones were considerably decayed.

EXPLORATIONS IN MOUNDS IN WHITESIDES AND LA SALLE COUNTIES, ILLINOIS.

By J. D. Moody, *Mendota, Ill.*

The explorations noted in Plan I, were made at different times in company with Dr. Everett, of Troy Grove, and Dr. Edwards, of Mendota, Ill. Those noted in Plan III, were made in company with Prof. Samuel Maxwell, of Lyndon, Ill. The "find" noted in Plan II, was made by some workman while digging for gravel.



Plan I.

The location of Plan I is about 4 miles in a southeasterly direction from the village of Troy Grove, La Salle County, Illinois. It is about 10 miles north of the village of Utica, on the Illinois River, near which was situated the great town of the Illini Indians, famous in the early history of Illinois.

All of the mounds discovered were situated on the bluffs on the eastern side of Vermillion Creek, a small stream flowing into the Illinois River.

No. 1 was a circular depression about 12 feet in diameter and 1 foot deep at the center. On trenching it we found evidence of a long-continued fire-place in the baked clay, burned stones, and fragments of charcoal, evidently the site of an Indian's fireside.

No. 2 was a mound 15 feet in diameter and 4 feet high, occupying a commanding position on a high bluff projecting out into the valley. The view from this point is a fine one, commanding the valley for miles in either direction. On opening the mound we made the following discoveries: In the center and just under the sod we found a great quantity of burnt bones, human and animal,—the latter those of dogs or wolves. From a careful examination of the fragments of skulls, we determined the remains of nine individuals. There was no evidence of fire in the soil. They had been placed there in comparatively recent times after having been elsewhere cremated. Along with these bones were found a few perfect arrow-points, numerous fragments, and a rude stone pipe fashioned somewhat like a spool.

On digging deeper, just below the original surface of the ground, was found a skeleton lying upon its back, with the feet toward the west. It was of an individual of average height and advanced in years, as indicated by the absorption of the alveoli and the angle of the inferior maxillary. The arms were extended along the body. The frontal development of the skull was of a low order, more so than is found in the Indian, and yet not so much so as is usually ascribed to the mound-builder. This was the only burial in a horizontal position discovered in this locality. A very careful examination of the soil about the head and upper parts of the body failed to bring to light any relics whatever. The burial was in a compact dry clay, and the bones in a crumbling condition.

No. 3 was a burial place on the point of the same bluff just spoken of. Nothing but bones were found in it, the remains of several individuals. One skull was taken out in good condition, lacking the inferior maxillary. The bones still preserved quite a portion of the animal matter, and indicated a comparatively late burial, presumably Indian.

No. 4 was a circular depression but a few feet in diameter, evidently, from the burnt stones, being a fire-place.

No. 5 was a mound about 10 feet in diameter and 2½ feet high. It had been opened a short time before our visit and a few bones taken out. From the description we received we could form no idea as to the character of the interment. No implements of any kind were found.

No. 6, on a broad flat in the bend of the creek, is the remains of an Indian encampment; numerous fire-places just beneath the surface of the ground, broken flints, &c., being found.

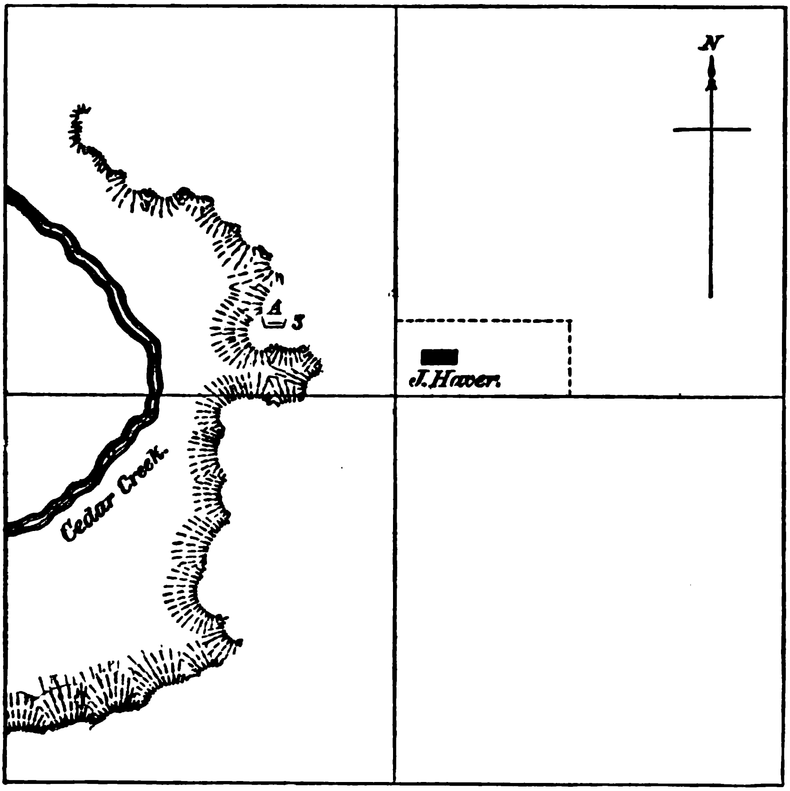
No. 7 is a group of three mounds. Having been plowed over for years, they were nearly obliterated. The remains in mounds *b* and *c* were alike, each containing the bones of several individuals thrown in promiscuously. They were not burned, yet each mound contained great quantities of ashes and bits of charcoal. The bones crumbled on the slightest touch, and presented the appearance of having been leached. In mound *a* one skeleton in tolerable preservation was found. It had been buried in a sitting posture. Near the head was found a large mussel-shell filled with what appeared to be paint. A little to one side and at bottom of excavation was an ash-pile with about one peck of charcoal in the center of it. Neither ornaments nor implements were found. This group was evidently Indian in origin.

No. 8 is a mound 35 feet in diameter and 5 feet high. Though regular in outline and occupying a commanding position, yet from our examination of its structure we considered its artificial origin as doubtful.

No. 9 is a mound 12 feet in diameter. In it was found one skeleton very much decayed, and near the head a very rude earthern bowl, holding about one pint.

No other mounds are found in the vicinity. Scattered over the bluffs and fields are found quantities of broken pottery, arrow-points, flint chippings, stone axes, &c. A copper spear-point was also found in the vicinity. From my examination of them, I assign to them an origin and date, with possibly the exception of the horizontal burial in No. 2, as of the Illini Indians, and of about the beginning of the seventeenth century.

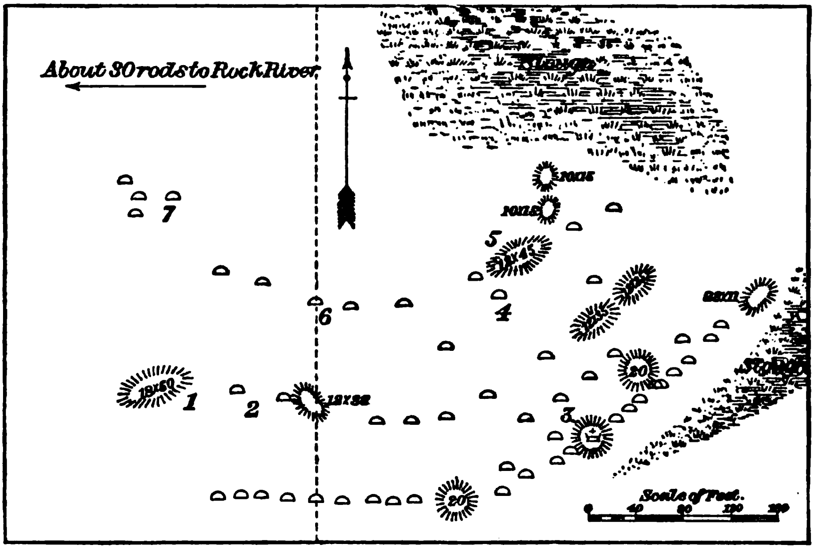
Plan II is located 4 miles southwest of the city of La Salle, on Cedar Creek, a small stream flowing into the Illinois River from the south. There were three graves two and a half feet deep, on a gravel point projecting out from the ridge. No mounds had been erected over them. They were close together. They were discovered by some laborers while digging for gravel. One of them, possessing a little curiosity, gathered up the bones and relics. One body was deposited in each grave, and in a recumbent position. The relics found consisted of several simple, rude pipes cut from sandstone, a few shell beads, arrow-points, and the fragments of a curious vase, holding, when reconstructed, about four ounces, and representing a man sitting on his knees, with hands folded across the abdomen. The opening was at the back of the head. It was composed of clay and powdered shells baked. The face presents strongly-marked Aztec features, or possibly an exceptional Indian countenance. The bones were very much decayed, with the exception of one side of one inferior maxillary. This was well preserved, and stained a deep green color. Not understanding the import of this, the laborers missed finding a copper implement of some kind. No other remains were found in the vicinity.



Plan II.

Plan III is a singular group of mounds 3 miles from Spring Hill post-office, Whiteside County, Illinois. The bluffs along Rock River are covered with mounds. This group, however, is on the alluvial bottom, about 30 rods from the river. Though there may be others on the lowlands, yet these are the only ones I found so situated. This group is in a semicircular form, in quite regular lines, as will be seen by a reference to the plan. They are on a plat of ground a little higher than the surrounding level. They are surrounded on three sides by a slough, in earlier times probably communicating with the river, and this may have had some influence in shaping the crescent form of the arrangement. However, being on the ground, the impression cannot be resisted that there was some special design in the grouping.

While most of the mounds were round and of varying size, some of them were long and narrow. The figures inside the circles indicate the dimensions of the larger ones in paces (2½ feet to the pace). Their relative sizes are preserved in the diagram. The ground is covered with timber. A stump standing on one of the mounds indicated an age of over two hundred years. The soil was a very hard, sandy clay. The space A of the diagram was inclosed and used as a hog-lot. None of the mounds were over three feet high. Nos. 1, 5, 4, and 7 were opened, but nothing whatever was found. In No. 2 we found no bones, but two rude vessels, holding about one quart each, made of clay and coarse sand molded on the inside of a grass basket and then burned, as evidenced by the impressions of the grass on the outside. No. 3 contained the remains of several individuals, lying side by side, but too badly decayed to be preserved. No. 6 had been bored through years before for a well; quantities of broken bones were brought to the surface. Our time did not allow of any further explorations. The regularity in the arrangement of the mounds presented a weird appearance in the forest. Some of the mounds on the bluffs opened at same time yielded the same results. On one a white-oak tree, three feet in diameter, was growing. Rude vessels and stone axes have been found in the neighboring mounds.



Plan III.

ANTIQUITIES OF FOX RIVER VALLEY, LA SALLE COUNTY, ILLINOIS.

By W. Hector Gale, *of Wedron, Ill.*

Having recently had the pleasure of examining a portion of the Fox River Valley, about 8 miles from Ottowa, the capital of La Salle County, Illinois, the author gives below the results of his investigations. The valley abounds in picturesque scenery of rocky bluffs and wide, fertile fields. The surface rocks are the Saint Peter's sandstone and Trenton limestone of the Lower Silurian. The drift in many places is 40 feet in thickness, consisting of a bluish clay, very hard, which, when undermined, breaks into blocks with the regularity of stratified rocks.

The Fox River passes along the eastern side of the valley in this locality, and is, in ordinary times, very shallow and rapid. The stream has, in the remote past, covered the entire valley, about one-half a mile in width. The ground is eminently historical as being the region which was explored by those intrepid *voyageurs*, La Salle, Tonti, Marquette, and Joliet, also the scene of the almost romantic extermination of the Illini Indians by the Iroquois. Within a radius of a few miles, and especially within this immediate locality, were enacted some of the most sanguinary scenes of the Black Hawk war.

But relics of a still older people are unmistakably visible here. It may be well to add that the course of the river here is from north to south. Perpendicular bluffs, of Saint Peter's sandstone, rise along the eastern shore, which are washed by the waters of the Fox, even at low water, while along the western side of the valley are sloping bluffs from 20 to 60 feet above the river. My experience during the late war teaches me that, were an enemy expected from the south, this locality, on account of its natural advantages, would be fortified and made a very strong place. It would seem that this fact was not lost sight of by the prehistoric inhabitants. On the west side of the valley, on a point of the bluff highest above the valley, I find an earthwork commanding the surrounding country, and facing toward the east and south. The bluffs are divided from those south by the Indian Creek, which enters the Fox about one-quarter of a mile distant, coming from the west, and has cut out a valley from that direction. The general shape of the fortification may be seen by an examination of Fig. 1. The large mound at the corner is highest, rising some 5 feet above the natural surface of the ground. Some time since, an excavation was made in the center of the mound, and a few bones found, but they had perished to such a degree that it would be impossible to describe any of its characteristics in an intelligible manner. On either side of the mound referred to is a smaller one, about 2 feet in advance of the main line, giving a passageway, gate, or entrance on either side, yet not leaving space entirely open and unprotected. In the rear of the fort, Fig. 1, is a thick second growth of oak and hickory. Immediately in front there are very few trees, but whether they have been removed by the builders of the earthwork, by a more modern race, or have never existed, I am unable to state. The valley, before cultivation, was a succession of mounds, crowded closely together, and the remains of many are still plainly visible. Some of these have been excavated, and in most cases found to contain skeletons, which, upon being exposed to the air, rapidly crumble away. In some cases stone

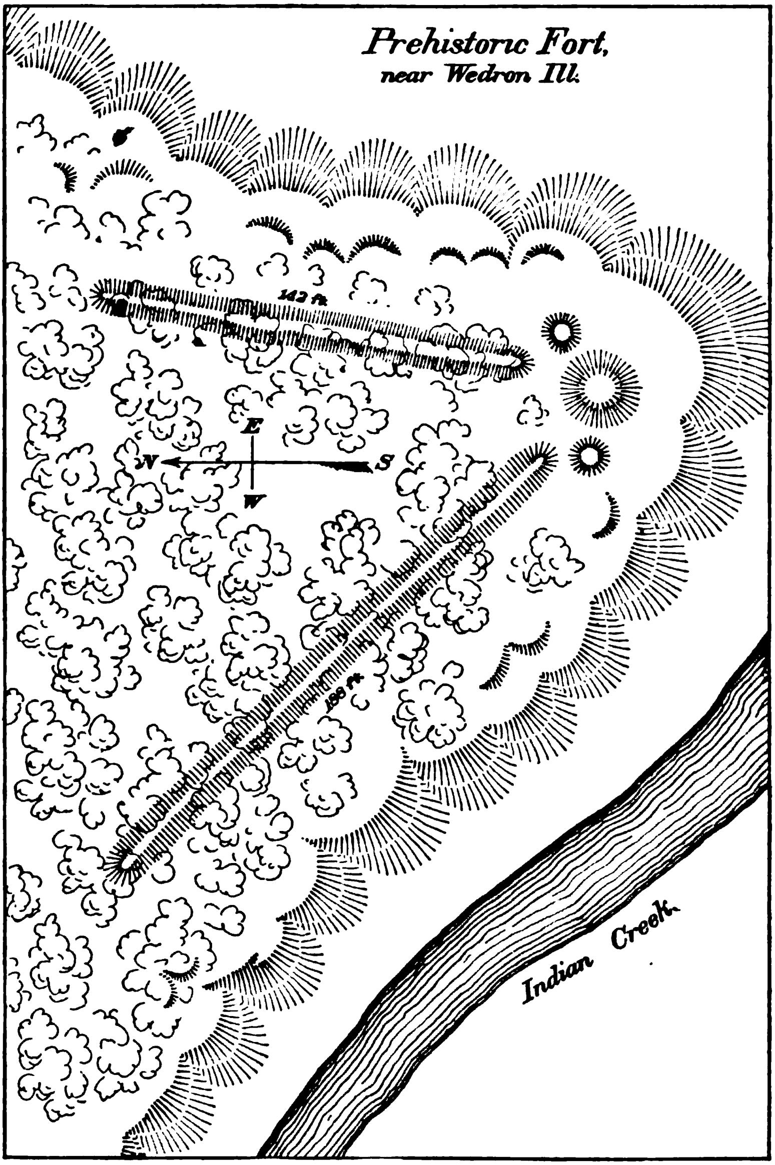


FIG. 1.

axes made of syenitic rock were found, and in one instance two earthen vessels or jars of rude workmanship. Across the river, in an easterly direction from the fortification just described, is another fort, facing in the same direction. This was surveyed by Col. D. F. Hitt, in 1877, and from this I take the drawing (see Fig. 2). The sand-rock is from 35 to 40 feet perpendicular above the river, and on the eastern side of the bluff is a ravine 65 feet deep, nearly vertical. The earthwork extends from the bluffs on the river side to the bluffs on the western side of the ravine.

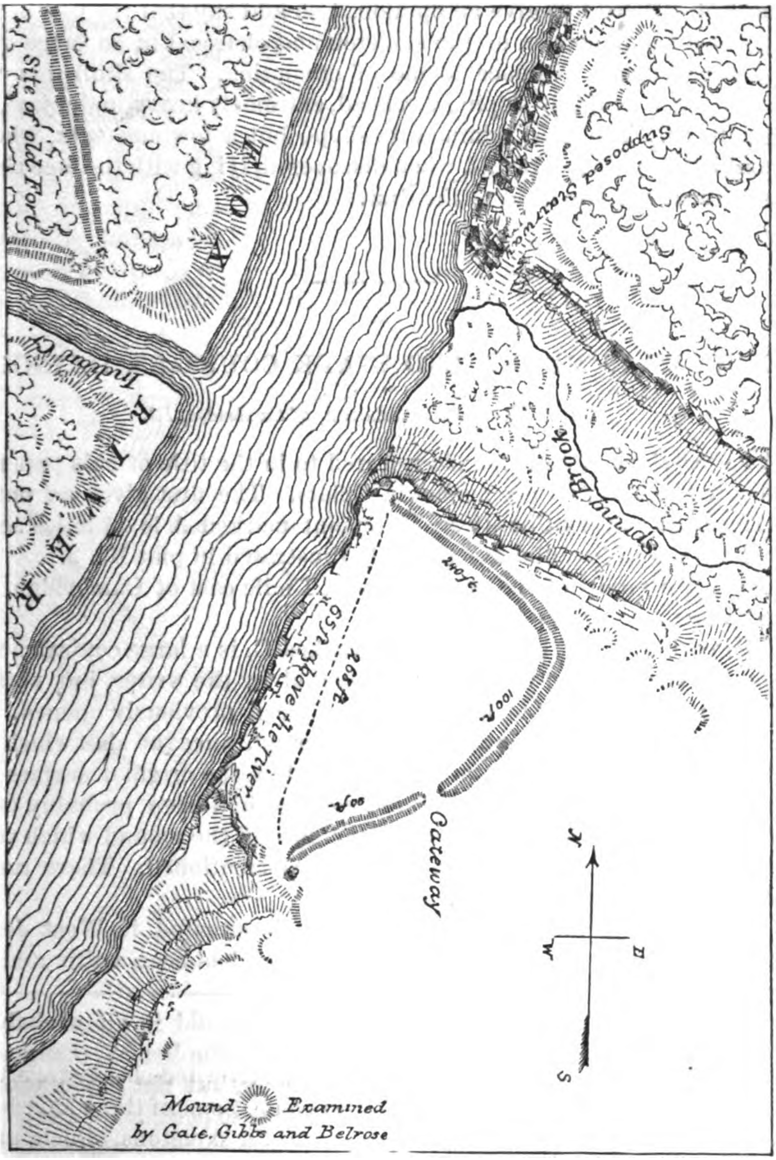


FIG. 2.

In my examination I discovered a mound about 80 rods south of the fort which bore no evidence of ever having been disturbed, and, in company with Mr. J. I. Gibbs, of Vermont, and Thomas Belrose, of Wedron, Ill., gentlemen interested in archæology, made an examination of its contents. About 2 feet from the surface we discovered charcoal in quite large quantities, and the skull, thigh bones, a fragment of the collar bone, and one joint of the vertebra of what had once been a member of the human family. Underneath was a number of granitic bowlders of quite large size, placed in a circular form, inside of which was found charcoal. Were I to give an opinion, I should say that the fact of finding but a small portion of the skeleton and charcoal in so large quantity is conclusive evidence to me of cremation. The skull was very narrow, with a rapidly sloping forehead, extremely heavy under jaw, and large teeth. The skull retained its shape but a few moments, when it crumbled in pieces. It was, when discovered, lying with the face nearly downward, and the head to the east.

MOUNDS IN HENRY AND STARK COUNTIES, ILLINOIS.

By T. M. Shallenberger, *of Cambridge, Ill.*

The locations of the mounds referred to in the title of this paper are indicated on the two accompanying plats. The first gives an outline of Henry and Stark Counties. The point marked A is 1½ miles southwest of Cambridge, and is more fully illustrated in plat No. 2.

At B is a group of fourteen mounds, 1 mile east of Cambridge, still unexplored.

In Peoria County, at the location marked C, is a large conical mound on the river bottom, which was excavated by the writer, but nothing of value was found, inasmuch as it had been proviously opened. No doubt a body had been interred in this mound, since the slab which had lain over it was still there, and the ground at the original surface was burned hard. Two other flat stones close by had been probably taken from the mound, there being no other stones in the mound which could have been used to support the slab before mentioned. There are no other mounds in the vicinity.

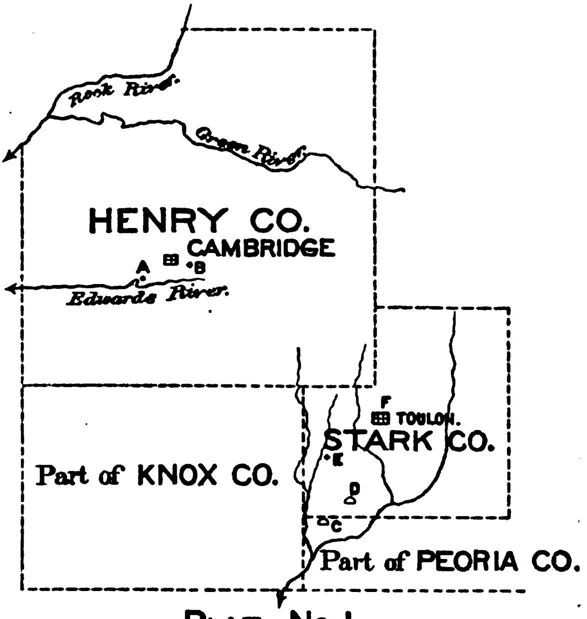
At D is a mound still unexplored. It is situated in West Jersey Township, and is yet 4 feet high, although it has been cultivated for several years.

The point marked E is a salt marsh, and would in all probability yield relics of prehistoric salt works and mastodon bones. Fragments of pottery have been discovered here already, but the exploration of this spot would be attended with considerable expense.

In the corporation of Toulon, marked F, from a very low mound were taken two axes and some white flakes like enamel. Judging from the deposits, as well as from the mold, a body had been interred here.

In the northeast of Henry County, at a point marked G, are immense sand-hills and swamps. The mound-builders evidently made this a rendezvous for game and fish, the sand-banks abounding in all kinds of relics. This is the Winnebago swamp, and scattered through it are many evidences of ancient inhabitants.

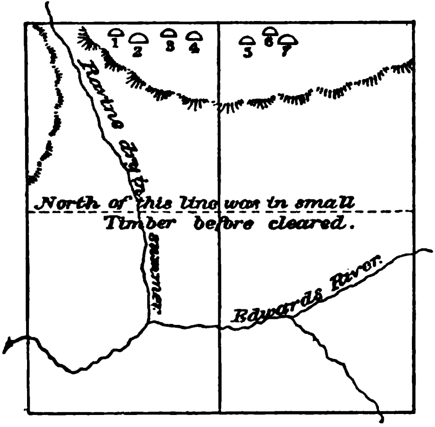
As mentioned above, Plat No. 2 is in enlargement of point A in Plat 1. The mounds will be described in the order of the numbers in the figure.



PLAT No. I.

1. The mound was opened and a polished agate was found, about the size and shape of a hen's egg, but more pointed. Both this mound and No. 2 are still covered with timber.

PLAT No. 2. 1 MILE SQUARE.



3. Nothing but ashes was found in the bottom of this mound.

4. At the bottom, the stump of a crab-apple tree was discovered, which had been felled by a blunt-edged tool. Another tree had grown on the surface of the mound, and the roots completely surrounded the ancient stump beneath. Another mound formerly located at this point has since been obliterated.

5, 6, 7. Permission to open these could not be obtained.

All the mounds mentioned in this paper are about the same size, 30 feet across, and 2½ feet high, and are built of material found on the spot. The last named are on the land of Peter H. Nilson.

ANTIQUITIES OF KNOX COUNTY, ILLINOIS.

By M. A. McClelland, *of Knoxville, Ill.*

The drainage of the eastern and southern part of Knox County, Illinois, is accomplished by numerous small streams navigable in the spring for canoes. Their general course is toward the southeast to empty into Spoon River, a tributary of the Illinois. In the northwestern part of the county numerous other small streams have their rise, and, running to the west, finally empty into the Mississippi. The portage between the headwaters of these streams is only a few miles in extent.

The trails anciently followed by the aborigines have now entirely disappeared, but along their former course, and upon the bluffs of the streams, are still found implements of war, amusement, and the chase. The discoidal stone, stone hatchet, and arrow-points sent to the National Museum were all found upon the north bluffs of Court Creek, principally upon sections 13, 14, 15, 16, township 11 north, range 2 east, Knox County, Illinois. The stone axes, and arrow-points came also from these sections, except the largest, which came from Haw Creek, section 3, township 10 north, range 2 east.

To all the interrogatories contained in circular No. 316 I return a negative answer, except as to mounds and cemeteries.

Mounds and excavations.—No. 1. One and a half miles west of Knoxville, on section 30, township 11 north, range 2 east, Knox County, Illinois, on the east side of a ravine running into Haw Creek, on a level piece of timber land belonging to Harvey Montgomery, esq., is a single mound 51 feet in diameter, and at the center about 3 feet above the general surface. The trees upon this land are of two ages, viz, first, large oaks, elm, &c., 2 feet 8 inches in diameter, and a smaller growth, of black-jack, and white oak, ash, hickory, &c., 6 to 8 inches in diameter. The mound is surrounded by six or seven of these larger trees, one on the southwest edge of the mound, the others, west, north, northeast, east, and southeast, at variable distances, from 20 to 32 paces. Upon the mound there are numerous trees, of from 3 to 6 inches, growing. There are very large areas of ground in this same timber, in which the larger trees are very sparsely scattered. The mound is circular in form, and 60 feet S. S. W. is a circular pond or excavation, about 40 feet across, from which, doubtless, much of the earth of which the mound is composed was taken. Within 60 feet of its western edge the ground begins to decline to form the ravine which carries the water from the adjacent praries to Haw Creek.

The mound had been dug into before, by whom I do not know, and I think nothing was found—at least that is the report. I cleaned out the former excavation, which was in the center, and about 4 feet across, enlarging it to 6 feet, carrying it at least 2 feet deeper, or 2½ feet below the general surface of the soil, and thence ran a trench 6 feet wide towards the west 10 feet. The composition of the mound from surface down was as follows: thin layer of humus; then yellow clay and humus mixed, becoming more largely mixed with humus as it reached the level of the surrounding country, this layer being 2 feet 10 inches; then a thin, light colored layer one-half an inch to an inch in thickness, which I suppose to be ashes of grass and leaves, as there was no sign of charcoal in any part of the layer; then a layer of a few inches thickness, similar to the surrounding soil; then a firm yellow clay, that had no appearance of having ever been disturbed. The ash layer was undermined to the extent of two feet on each side. It was found to lie horizontally and at about the level of the surrounding ground. Nothing else was found.

No. 2, on the southeast quarter of the northeast quarter section 16, township 11 north, range 2 east, Knox County, Illinois, is 36 feet across, and on the east side of a ravine that runs into Court Creek from the north. The land is lightly timbered. A quarter to a half a mile nearer Court Creek, however, there are some fair-sized trees (2 feet). The ground immediately surrounding has hazel brush and scrub oaks, black-jack, &c. In height the mound is similar to No. 1. Its envelopes are similar, but the ash layer contains decided traces of charcoal. Nothing found by a very positive excavation carried to the depth of 3½ feet below level of surrounding surface. In the fields around for a quarter of a mile a great many arrow-points have been found. The twenty-eight nearly or quite perfect ones sent in package to the National Museum were found within this area.

To the north and a little to the east, about 100 rods, there is a very high point of land, from the summit of which an extensive view may be had of the surrounding country. This hill is and has been for thirty or forty years under cultivation, and upon it arrow-points in large numbers have been found. There are places on it where the ground is white with flakes and chips of the same material as the arrow-points. The stone hatchet of Witterell's collection was found about 40 rods east of the top of the hill. Between this point and where the hatchet was found, the old trail running from Maquon, on Spoon River, to Henderson Grove, on the head of Henderson Creek, was easily recognized thirty years ago. Upon the eastern slope of this hill and upon both sides of the old trail, and upon the south slope, towards the mound, are found numerous deposits of small, mostly flat-faced stones. The stones are found now but 2 or 3 inches beneath the surface. These are so placed that their flat faces are on the same horizontal plane, and cover a space of a foot or two, with intervals of a rod or two between them. Many of them are reddish, as if some ore of iron might enter into their composition, which upon being heated had become changed to red. The stones present other appearances of having been subjected to the influences of fire.

Trails.—Thirty years ago there were three distinct trails running across the country. One ran from Maquon, on Spoon River, to Henderson Grove; thence, in a northerly direction, to Galena, on the Mississippi. Another from the mouth of Court Creek, on Spoon River, to the same points. A third trail ran from Maquon north to strike the trail from mouth of Court Creek to Henderson Grove. These two trails met in township 11 north, range 3 east. Along these routes all the specimens sent you were found. Maquon was an Indian settlement on Spoon River. Here, within the memory of our oldest settlers, they had a village, and lived from year to year. There is an old Indian cemetery at this point and another at the mouth of Court Creek. Near the south line of Knox County, half a mile west of Spoon River, there is a group of three mounds, not yet examined, and half a mile further south, in Fulton County, there is another group of three, none of which have been explored.

DESCRIPTION OF A GROUP OF MOUNDS IN BUREAU COUNTY, ILLINOIS.

BY A. S. TIFFANY, *of Davenport, Iowa.*

The group of eight mounds described below and represented in the accompanying plan is situated near Bureau, in Bureau County, Illinois, on the bottom lands of the Illinois River and Bureau Creek.

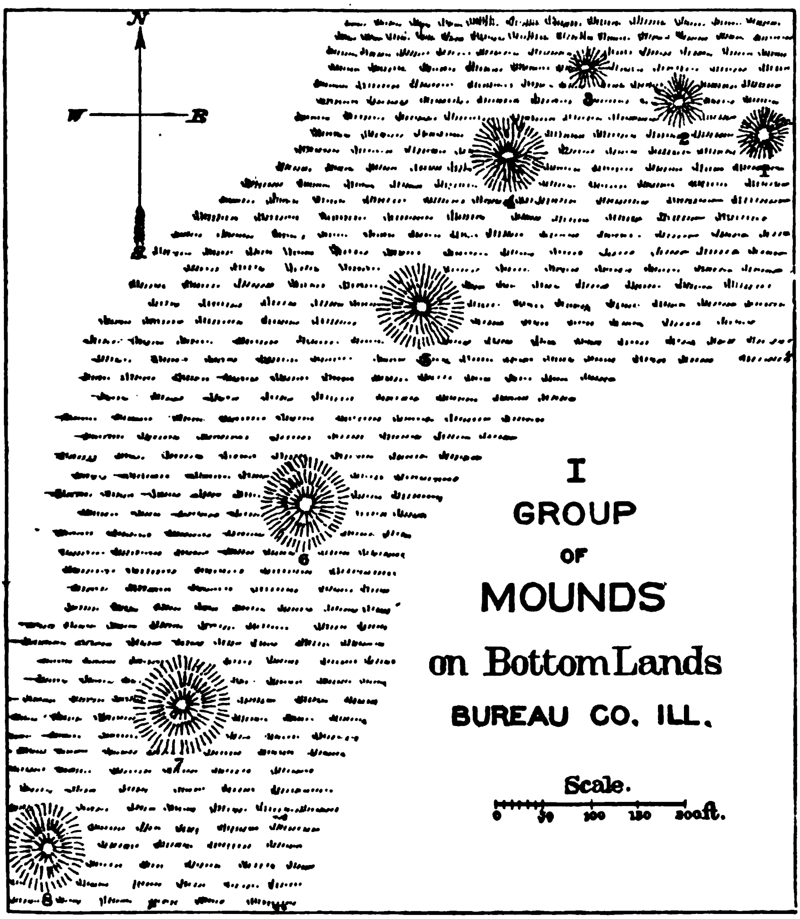
The land on which they are located has been farmed about forty years, and the smaller mounds have been considerably reduced. Numbers 1 to 3 are situated on a natural swell, and the diameters can be determined only approximately. These three were explored by the writer and Mr. Sale.

Dimensions and distances of the mounds.

No.	Diameter	Height.	Directions.	Distance.
	Feet.	*Inches.*		*Feet.*
1	50	30	W. 20° N. to No. 2...	90
2	50	30	W. 20° N. to No. 3...	100
3	50	30	W. 45° N. to No. 4...	120
4	70	36	S. 40° W. to No. 5...	185
5	80	48	S. 25° W. to No. 6...	210
6	70	42	S. 25° W. to No. 7...	240
7	90	66	S. 25° W. to No. 8...	210
8	80	48		

A rectangular opening, 7 feet square, was made in mound No. 1. At a depth of 15 inches a bed of ashes several inches in thickness was reached, which extended in all directions beyond the opening. At a depth of 5 feet a few bones, much decomposed, were found. They were parts of two individuals. A small number of bone awls were lying near them.

A slight dip in the floor of the mound was observed in the northeast corner. The exploration was extended 9 feet further, making the entire length of the opening 16 feet. The remains of two individuals were found with their heads toward the north. Under the head of the individual lying upon the west side was discovered a porphyry crescent-shaped implement of rare beauty. It is polished on both sides, and all its edges are nicely wrought. The perforation does not extend through the stone, being only .55 inchs in depth, but sufficient for mounting. A flint knife was deposited with the same individual, about where the right hand would naturally be.



At the northeast corner of this excavation, with some decomposed bones of the other individual, a bone awl or needle was recovered, about four inches in length, but a portion had been broken off. It was gracefully tapering and finely pointed.

A few pieces of pottery obtained were of the same character as that which occurs universally in this region. The crania were too fragile to be saved. A few unio shells and water-worn pebbles had been deposited in different parts of the mound.

In mound No. 2 the skeleton of a youth, much decomposed, was all that rewarded our labor.

In mound No. 3 no human remains or objects of interest occurred.

The second group of mounds surveyed are situated on the bluff at Bureau, Bureau County, Illinois. The measurements are given in the accompanying table:

No.	Diameter.	Height.	Angle.	Distance from center to center.
	Feet.	*Inches.*		*Feet.*
1	18	18	S. 20° W. to No. 2. ..	18
2	21	80	W. 20° S	83
3	21	20	S. 40°	120
4	80	40	W. 20° N...........	50
5	30	36	S. 40° W	130
6	21	18	S. 40° W............	250
7	80	30	S. 20° W............	150
8	86	36	S. 40° W *	73
9	24	80	S. 40° W............	89
10	21	15	N. 20° W.	30
11	25	12	S. 30° W	24
12	24	24	W. 20° S †	66
13	27	20	S	49
14	80	24	....	80
15	24	80	E. from No. 18......	80
16	25	20	S. 10° E	45
17	24	20	W. 20° S............	57
18	27	80	S. 20° W............	80
19	18	10	S. 20° W............	24
20	24	27	S. 20° E.............	27
21	15	10	S. 20° E ‡	30
22	27	48	S. 40° W............	80
23	24	15	S. 20° E §	24
24	24	24	S. 10° W............	78
25	20	24	S. 10° E.............	to No. 25

* Explored; pebbles, cedar wood, decayed, and coal; one skull.
† Oak stump; 160 annular rings.
‡ Oak stump; 450 annular rings.
§ Large white-oak tree.

MOUNDS IN SPOON RIVER VALLEY.

By W. H. Adams, *of Peoria, Ill.*

On what is usually termed a hog-back, on the north side of the Spoon River, 75 yards distant, 80 rods west of the east line and 20 rods south of the north line of section 12, township 11 north, range 43 east of the fourth principal meridian, is a round mound about 30 feet in diameter. On the highest point of the hog-back, at the surface, is some evidence of fire. The evidence of a former fire increases very rapidly. At a depth of from 12 to 16 inches five skeletons were found, of which nearly all the bones were calcined, and many of them entirely consumed by the fire. One of the skulls lay to the north, one to the northwest, one to the southwest, one to the south, and one to the northeast. With the bones were fragments of sandstone burned red; at or near each skull, and nearly on a line between the point of the shoulder and ear, was a water-worn pebble, except in one instance, and in that it was an angular piece of flint. The pebbles had not been acted upon by the fire, so that they must evidently have been placed there after the intense heat had sub-

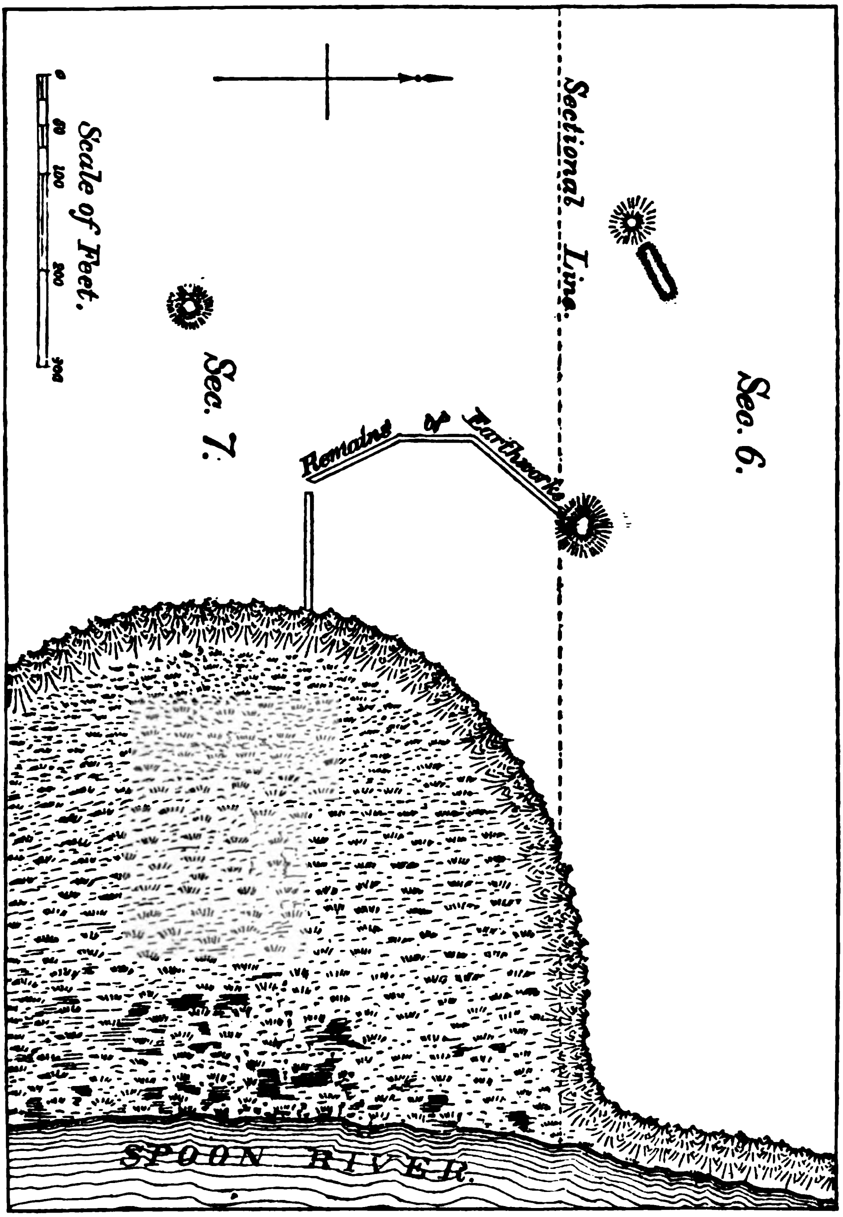


FIG. 1.

sided. From the appearance of the earth one would be strongly inclined to believe that the fire in this instance had been one of unusual intensity. From the position of the skulls with reference to one another, the feet of one body would reach to the head of the next, if laid at full length. One of the skulls was rather thinner than those we usually find in other mounds. Some of the teeth evidently belonged to a person of great age, while others were very small, but I cannot say that they belonged to an infant. The skulls were in fragments, the largest piece obtained being about 2 inches square.

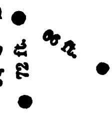
On another hog-back, east of the one described, commencing on section 12, township 11, range 4 east, and extending across the northwest corner of section 7, township 11, range 5, and also some distance on section 6, township 11, are thirteen common round mounds, varying in height from 18 inches to 5 feet. As far as examined these are burial mounds, and nineteen skeletons were found in one of them. This mound was 45 feet in diameter and 5 feet high. The bones in it were in a fair state of preservation. I opened four or five of this group, and in each were found pieces of trap-rock from 1½ to 2 inches square, pieces of burnt sand-rock, and small water-worn pebbles, which I suppose to be jasper or something of that character, and in the largest mound was discovered a very small fragment of red pottery.

On the high bluff between Spoon River and Walnut Creek, on the south line of the southeast quarter section 6, township 11 north, range 56, are three mounds of some importance. The first is a common round mound, 3½ feet high, with a base diameter of 40 feet. This mound is three rods north of the sectional line between sections 6 and 7, and 60 rods west of the east line of section 6. (The land is owned by Henry Jaques.) I opened this mound at the apex, and at a depth of 2 feet found quite an amount of ashes, also one piece of trap-rock of irregular shape, and about the size of a small boy's head; also a honestone arrow point of the leaf-shape pattern. Eight feet east of this is a mound 62 feet long and 19 feet wide, with the greatest length from southwest to northeast. I made a cross cut of this mound at the middle, and in the center found a bed of charcoal, 10 inches deep, intermingled with ashes. I also made an opening near the east end and found nothing. Twenty rods east of this, on the sectional line, is an oblong mound, measuring 64 feet from west to east, and 47 feet from north to south, with an apparent height, above the surrounding level, of 3 feet. I made an opening in the center of this mound, 4½ feet in diameter, and at a depth of 2 feet I found some ashes and fragments of stone which had been polished, and 3 inches of yellow clay. This clay has the appearance of having been rammed or packed while in a plastic state. Below the clay is a thin stratum of red paint, and below the paint were ashes and paint intermingled. In this material were found fourteen arrow points made of honestone, all of the leaf pattern except one, and this was 3½ inches long, with notches at the base, and had the appearance of having been used;

also a small piece of galena was exhumed. There was a slight depression on the surface above the deposit. I made an opening 9 feet east of the center, in which was obtained a copper awl or needle 3½ inches long, and three-sixteenths of an inch square, thick in the middle, and sharp pointed at each end. This copper implement was inclosed in some material, which, under a microscope of low magnifying power, has the appearance of being the bark of a tree. This tool lay with the points southwest and northeast. I also found a white-flint spear-point or lance-head, 4 inches long and 1½ inches wide, without notches at the base. We found the flint implement about 10 inches southwest of the copper. This was surrounded by the same red material as the first. We first made an opening 14 feet west of the center of this mound, and at a depth of 3 feet 8 inches we found one copper needle or awl, rounded and pointed; three copper beads one-quarter of an inch in diameter and three sixteenths of an inch in length; one piece of copper tubing or bead 1 inch in length and one-quarter of an inch in diameter; one piece of tubing or bead three-sixteenths of an inch in diameter and 1 inch in length; one piece 1⅝ inches in length and one-quarter of an inch in diameter; and five other pieces very much like those described; also a small fragment of a tooth supposed to be human, and several small flint pebbles.

There are traces of a breastwork or fort, commencing at the southwestern part of this mound, about 6 to 12 inches in height. Commencing at the mound it extends southwest 120 feet, thence south 67 feet, thence south-southeast 106 feet, thence to bluff of Spoon River 130 feet (the bluff is 40 feet high), from the mound to the bluff in a straight line southeast 186 feet.

All the arrow points were finely finished, and far superior to those found on the surface of the ground. This mound is 42 rods west of Spoon River. The bluffs here are composed of the usual yellow clay, and contain very little sand. On the northeast corner of the northwest quarter of the southeast quarter section 5 are three common round mounds, standing in a triangular position to each other, with the largest to the north, the next in size directly south of it, and the smallest to the east, somewhat like the following figure:



On or near the southwest corner of section 4, township 11 north of the base line 5, east of the fourth principal meridian, are a series of common round and long mounds of more importance than any other yet discovered in this part of Illinois. (See Fig. 2.) Commencing at a point near the foot of a long bluff sloping to the south, and 40 rods north of the south line of section 4, and 10 rods east of the west line, are three common round mounds. For convenience we have numbered these, commencing with the most westerly. The distance is reckoned from center to center of round mounds, and from end to end of long mounds.

From 1 to 2 is 39 feet from center to center, from 2 to 3 is 30 feet from center to center, from 3 to 4 is 50 feet from center to center. This last mound is 80 feet long, with a cross mound at the center 33 feet long, 2 feet high, and 10 feet wide. The principal mound is 15 feet wide.

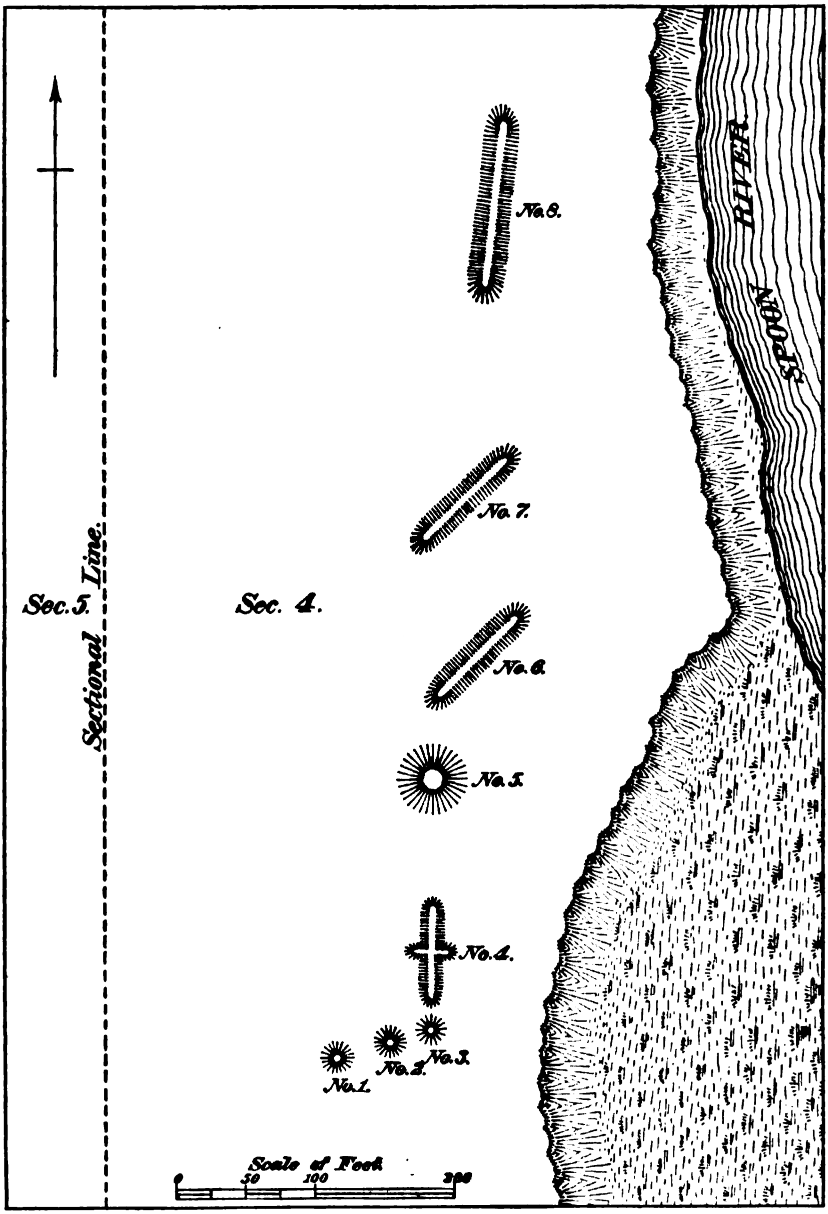


FIG. 2.

From No. 4 to No. 5 is 123 feet. No. 5 is a common round mound, 3 feet high, with a base diameter of 40 feet. No. 6 is 53 feet from No. 5, 98 feet long, 2 feet high, and 18 feet wide, with the greatest length from southwest to northeast. No. 7 is 75 feet west-northwest of No. 6, and is 104 feet long, 2½ feet high, and 18 feet wide, with the greatest length from southwest to northeast. No. 8 is 100 feet from No. 7, and is 140 feet long, 3 feet high, 20 feet wide. Fifty feet from the south end of this is a black-oak tree, 3 feet in diameter, standing in the middle of the mound. (In accordance with the usual rule in this vicinity of computing sixteen growths to the inch, measuring on one side of the center, this tree was nearly three hundred years old.) This mound is 100 feet west of the bluff of Spoon River. The bluff is 40 feet high at this place, and very precipitous. In company with Mr. W. J. Morris, I made a cross cut in this mound to the original soil. At every spadeful we would bring up flint chips, and we found several pieces of trap-rock, some of them being polished on one side. Around the mound where the surface is bare great quantities of flint chips are picked up. We made a slight examination of Nos. 6 and 7, and found nothing, excepting traces of ashes and charcoal. On opening No. 3, at a depth of 2 feet, we found ashes; at 2½ feet, 6 to 8 inches of charcoal and ashes; at 3 feet, hard-packed earth; at 3 feet 3 inches, two skeletons, all the bones very much decayed, except the teeth, and these were not worn, showing the owners to have been not over thirty years of age. We opened Nos. 1 and 2, and found nothing. All the mounds appear to have been built at the same time, by the same people.

Spoon River at this point is 100 feet wide. We found no depressions whence the material of which these mounds are built was taken.

BURIED FLINTS IN CASS COUNTY, ILLINOIS.

BY J. F. SNYDER, M. D., *of Virginia, Ill.*

Prof. Joseph Jones has well said that "the fabrics of a people unlock their social history; they speak a language which is silent, but yet more eloquent than the written page."

To every thoughtful person there is a peculiar interest in the remains of nations that have fulfilled their destiny, and passed away; and this interest grows to fascination when studying the works of art, however rude, of people who have disappeared, and left no other legible records of their history and characteristics.

The origin and language of the prehistoric occupants of this region may remain forever unknown to us, and their color and personal appearance be only conjectured; but their implements, utensils, and ornaments, which have escaped the ravages of time, when properly interpreted, repeople our hills and prairies with their ancient inhabitants, and tell us, in language as plain as the written page, the story of their domestic pursuits and arts of life; of their customs, superstitions, and habits of thought.

In this view it is important that all discoveries of the remains, either of the works or the skeletons, of the aborigines, it matters not how insignificant, apparently, or how similar in kind they may be, should be carefully noted and accurately recorded, as each may possibly increase in some particular our knowledge of the primitive American tribes, or serve to confirm anew some fact of their history already known. Every stone implement, shell or bone ornament, and earthen vessel recovered, is a silent revelation of the past; and from this accumulated material the restoration of ancient life upon this continent is becoming annually more and more distinct.

It is well known to have been the custom of pre-Columbian Indians, as of their descendants in later times, to hide in the ground, for security until again wanted, stores of surplus provisions, and such implements and other articles as were not immediately needed or easy of transportation. Many of these buried stores of perishable materials, forgotten, or from other causes never recovered by their owners, soon totally disappeared; but others, consisting of objects wrought in stone, bone, and shell, are yet occasionally discovered in all parts of our country previously inhabited by the red race. These deposits are all full of interest, and some are wonderful for the surprising numbers, or weird beauty of design, or marvellous forms of the strange things they comprise.

Within the limits of this county two small subterranean long-hidden stores of flint implements have been recovered by the plow during the last two years. In the alluvial soil of Central Illinois, so destitute of surface rock, a stone of any kind turned up by the plow is of so rare occurrence as to at once attract the attention of any plowman, but unfortunately many valuable specimens so found excite but momentary notice and are again lost.

In the spring of 1880, Mr. George W. Davis, an intelligent farmer residing in Monroe precinct, 10 miles east of the Illinois River, when plowing one day in a field that, until a few years ago, had been covered with a heavy growth of timber, observed in the furrow his plow had just made a few sharp-pointed flints, and stopping his team to secure them, he found on examination that they formed part of a deposit consisting of thirty-two small implements, which had been carefully placed in the ground, on edge, side by side, with their points toward the north. They seem to have been buried near the foot of a large oak tree long since prostrated and decayed. This spot was on the crest of the ridge bounding the valley of Clear Creek on the south, and half a mile distant from a corresponding elevation on the north of the little stream, known locally as "Indian Hill," so called because the skeletons of several (supposed) Indians with stone implements, bone awls, glass beads, &c., were some years ago disinterred there in the process of grading a public road.

The thirty-two implements were presented to me by Mr. Davis. With one exception they are made of a cherty, muddy-looking siliceous stone, of grayish color streaked with white; a flinty formation occurring in all lead-bearing strata of Illinois, and identical with the cherty nodules and seams very common in the sub-carboniferous outcrops of the upper Mississippi and southwest Missouri. They had been buried new, showing no marks of having been used, and their peculiar style of workmanship and similarity of design leave but little doubt that they are the product of the same artisan. The exceptional one in the deposit is a well-proportioned and perfect spear point, nearly 3 inches in length, neatly chipped from opaque, milk-white flint, strongly contrasting in material, shape, and finish with the others, and evidently manufactured by some other hand, perhaps in a different and remote workshop.

Fourteen of the lot are of the laurel leaf or lanceolate pattern, pointed at one end and rounded at the other, with edges equally curved from base to point, averaging three-eighths of an inch in thickness in the middle and evenly chipped to a cutting edge all around. They are uniform in shape, but differ in size; the smallest measuring 2¾ inches in length by 1¼ inch in width at the center; and the largest one is 6 inches long and nearly 2 inches wide. These fourteen are of a type quite common in all parts of the Mississippi Valley, and are supposed to have been used as *knives* or ordinary cutting tools. In our collection are six of these supposed knives, taken a few years ago from a deposit of over four hundred in West Virginia, and very similar in material, pattern, and dimensions to the fourteen now before me.

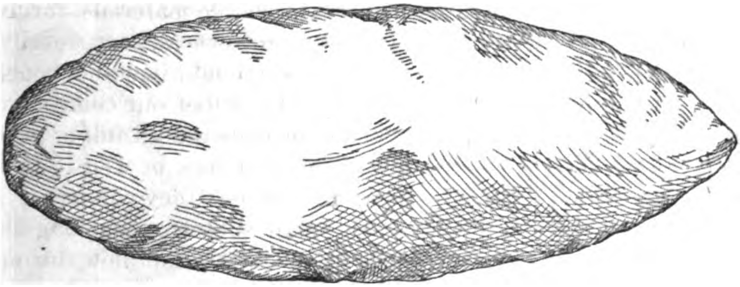


FIG. 1.

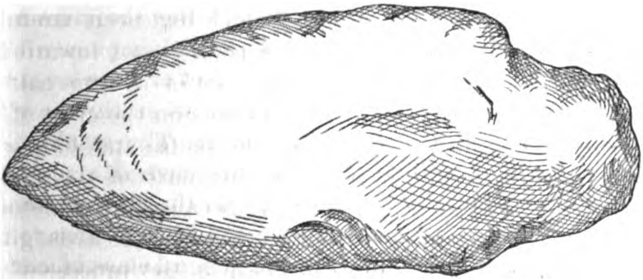


FIG. 2.

The remaining seventeen are shaped alike, but also differ in size as the first do, and are of the same average thickness. They too are sharp pointed at one end, but in outline from base to point their sides are unequally convex, one being considerably curved and the other curved but little from a straight line, giving them an ungainly and lop-sided form. Their broad ends, originally rounded, probably, like the first fourteen, have been chipped away on each side for half or three-fourths of an inch from the extremity, forming a broad rudimentary shank. At first glance these objects would readily be mistaken for unfinished awkwardly shaped spear-heads; but slight examination proves them to be completed implements, all fashioned after exactly the same pattern, with one end pointed, a greater convexity of one side than the other, and the base which in the first fourteen is regularly rounded, in these has been slightly cut away on each side, perhaps to facilitate their insertion in some sort of handle. The greater rounding out of one side than the other in all cannot be accidental, or due to want of skill in the workmen who made them; and this odd design is not easily reconciled with the ordinary forms and uses of spear points. Occasionally flint arrow-points are found approximating this shape, one side from point to shank describing a slightly curved or straight line with the other side regularly barbed, or curved, as in the common types. In our collection are two specimens somewhat concavo-convex, or sickle-shaped. It has been gravely suggested that implements of this form were so made, and intended for use, exclusively for spearing and shooting fish, on the hypothesis that the greater weight of one side of the flint, or its irregular form, would give the shaft to which it was attached, when launched, a curved direction, thereby overcoming the water's refraction of the solar rays, and cause the weapon to strike the real and not the apparent position of the fish aimed at. In order to test this idea I made several experiments with the abnormally shaped flints. Securely fastening the one-barbed arrow-heads in straight, perfectly made arrows, I shot them with a strong sinew-backed Indian bow, at marks in the water and in the air, and found in every instance that the deformed flint had not the least tendency to deflect the shaft from its direct course. I then inserted some of the lop-sided implements from this Clear Creek deposit in light javelin shafts 5 feet or more long, and failed to discover the slightest deviation of flight when thrown either with much or little force in the air or in the water. The result of these experiments led me to conclude that the one-barbed arrow-points are merely weapons accidentally mutilated; and the most reasonable view of all the flints in the deposit now under consideration, save the intrusive white spear-point, places them in the general class of common cutting tools.

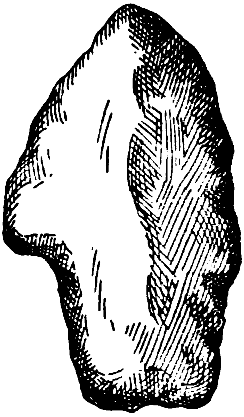


FIG. 3.

The second deposit of flints to which I have alluded was also turned up by the plow, on the 28th of March of the present year (1882), on the southern border of this county, 26 miles east of the Illinois River. Its location was on the brow of the hills overlooking Indian Creek to the south, and in a field cultivated for the last ten years, but which had been cleared from a dense growth of large forest trees. In this *cache* were thirty-five elegant implements entirely different in form, material, and finish, from those before described. Their position in the ground was vertical and closely packed together, but otherwise without any peculiar arrangement. Axes and other objects made of copper, buried in the ground long ages ago by their rude owners, are now and then found, in many instances still encased in shreds of coarsely woven fabrics in which they had been carefully wrapped; the preservation of the matting or cloth being due to the salts of the decomposing metal. It is probable that the articles in all minor deposits, as the two here described, were also enveloped, when consigned to the safe keeping of the earth, in bark cloth or dressed skins, which, in the absence of antiseptic mineral oxides, have long since decayed without leaving a trace of their presence.

The thirty-five beautiful flints of this Indian Creek deposit are the perfection of ancient stone-chipping art. In form they are of the broad, or lilac-leaf pattern, pointed more or less obtusely at one end and regularly semicircular at the other; the length but little exceeding the width; scarcely more than three-eighths of an inch thick in the center; they are smoothly chipped to an even sharp edge all around. They vary a little in size and somewhat in proportions, in the greater number the length exceeding the breadth by scarcely a third, while in a few, approaching the lanceolate type, the length is twice that of the width. The smallest of them is 3¼ inches long by 2⅝ inches broad at the base; and the largest one measures 5 inches in length and 3½ inches

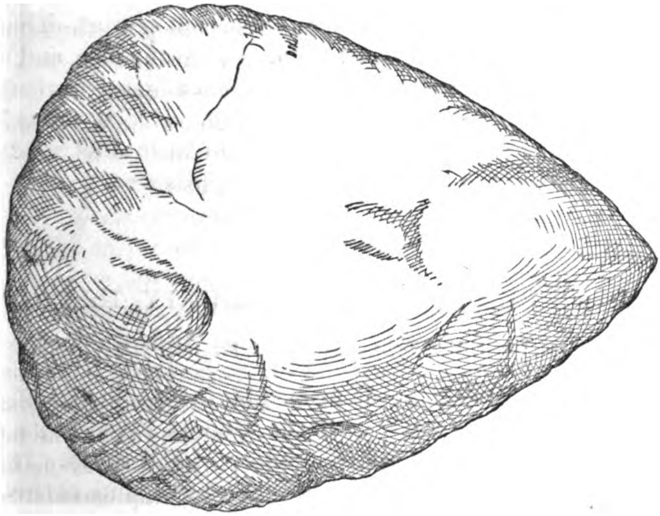


FIG. 4.

across the widest part. Six of them are made of mottled red and brown glossy jasper, and the remaining twenty-six of ordinary white flint, shading in texture from the compact translucent glassy, to the opaque milk-white varieties. In one of the neatest and most perfectly proportioned specimens the natural conchoidal fracture of the stone from which it was struck gives one side its exact contour without aid of any chipping. In several are embedded fragments of fossil crinoidal stems around which the siliceous atoms in solution or suspension first collected and solidified to form the rock; and in six there remain near the edges small patches of the buff, rind-like calcareo-siliceous outer coating of the flint-nodules from which they were split, not entirely removed by the process of manufacturing. The rounded edge of each is smooth and worn, and the sides of some are gapped, testifying to long and hard usage before their interment, and indicating conclusively that the broad circular edge of the tool was the one chiefly used. There is no reason to believe that these beautiful objects were used as weapons in any manner. Their pointed ends may have been inserted in handles of some description for convenience of manipulating them; but their crescent edges, so similar to the half-moon knives of modern curriers and other leather workers, forcibly suggest their use as skin-dressers. They are too fragile to have been serviceable in the scraping work of canoe-making, or in shaping any hard-wood or bone instruments; and could not have so well preserved their fine edges as hand-used agricultural implements, or clay-diggers for pottery making. Hence, I conclude that they were the *vade mecum* of the squaws, and their chief reliance in all their work requiring the aid of mechanical appliances.

INDIAN REMAINS IN CASS COUNTY, ILLINOIS.

BY J. F. SNYDER, M. D., *of Virginia, Ill.*

Cass County fits into the angle formed by the confluence of the Sangamon, flowing from the east, with the Illinois River in its course to the Mississippi, a little west of the center of the State. It is not in the "forks" of the two rivers, but the one sweeps its entire northern border while the other bounds its limits on the west. Its topography is identical in main features with the most part of the great undulating prairie system of the State; and may be briefly described as a scope of open rolling land, studded with groves and furrowed with creeks and rivulets, and fringed all along its northern and western portions with ranges of bluffs which form the boundaries of the river valleys. Extending from the foot of these ranges of bluffs to the rivers lie the rich alluvial "bottoms" varying in width from 2 to 7 miles. Viewed from below the bluffs rise to the height of 150 feet in picturesque grass-covered peaks and ridges separated from each other by deep wooded glens and gorges; and the bottoms, gently declining from the hills for half their width, are smooth as lawns, and now converted into the finest farms in the State, then reaching a lower level as they near the rivers, become heavily timbered and interspersed with numerous lakes and sloughs. Nature was here lavish in its supplies of fish, game, and wild fruits, and every condition necessary for the subsistence and endurance of a large population was present. This beautiful and fertile region, it is evident, was occupied by successive tribes from the earliest times before our history began down to the peaceable expulsion of the last of its dusky tenants, the Sacs and Foxes, during the administration of General Jackson. In testimony of this fact we have the relics of their remains, arts, and methods of life, which time has been powerless to destroy, in great profusion and full of fascinating interest. Of these silent records of a rapidly vanishing race the most important as well as the most legible are the earthen mounds which cover the bones and dust of their dead. They crown all the peaks and ridges of our bluffs, a few rising to considerable proportions, but the greater number are mere swellings of the surface not readily recognized as being of artificial origin. Every gradation of mound structure is here present, from the stately tumulus 30 feet in height to the broad, flat sepulchres so slightly elevated as to be scarcely noticed.

It would be useless labor and waste of time to attempt to locate on a map the situation of each mound or group of mounds in Cass County, and a tedious and unprofitable repetition to detail minutely the examination of each separate mound. For brevity of description they can readily be grouped in two or three classes, and the description of one will answer generally for all of its particular class. While in all of them, so far explored, the inclosed bodies of the dead were deposited on the surface of the ground, we find in some the position and arrangement of the remains to have been different from that found in others; from which we must infer that at times changes and innovations in mortuary customs were introduced, perhaps by different tribes who succeeded each other in occupancy of the country.

Of the first class of mounds, and by far the largest, and no doubt the most ancient, but one has yet been opened, and, unfortunately, no one versed or interested in ethnological study was present at the time to collect and preserve the relics it disclosed, or make any record of them. This mound, which I have before had occasion to mention,* formerly stood immediately upon the bank of the Illinois River, within the present limits of the city of Beardstown, 6 miles below the mouth of the Sangamon. This locality is slightly more elevated than the surrounding river bottoms on either side, and was anciently an island surrounded on one side partly by the Illinois and on the other by a slough through which the river had once passed and yet discharged its surplus water. The island, on account of its peculiarly favorable position, had been for centuries a camping ground and stronghold of the aborigines. Geologically it, as well as most of the bottom, has a basis of loess or drift clay with a superincumbent stratum of sand 5 to 10 feet in thickness. All around the site of the mound the soil to the depth of 20 inches is composed of the *débris* of old camps, a mixture of ashes, mussel shells, bones of fishes and wild animals, charcoal, broken pottery, &c.; and here hundreds of implements of stone, bone, and shell have been obtained. The big mound is said, by persons who have often seen it before the hand of vandalism desecrated it, to have been more than 30 feet high by 150 feet in diameter at the base. Its summit commanded an uninterrupted view of the distant bluffs on both sides of the river and of the stream itself for 2 or 3 miles above and below. We can easily imagine the strange scene this great cone presented when it swarmed one autumn day with an eager, startled multitude of wild, half-naked barbarians gazing with astonishment at the sun-burnt, bearded faces and tattered garments of Marquette and Joliet as they wearily paddled their frail canoe up the quiet river at its base. More than thirty years ago the city authorities of Beardstown commenced the destruction of this splendid monument to utilize the clay of which it was composed for covering the sand of their streets, and in a few years the grand structure was totally demolished. The mound was found to have been made, on the sand, of clay taken from the bed of the river at low water or brought from the bluffs; and it had been used as a burying ground by people of different eras and races. Just below the surface the shallow graves and well-preserved skeletons of recent Indians, buried with implements of stone and iron and ornaments of glass and brass, were shoveled out; and a little deeper the spades uncovered the remains of a few Europeans, deserters, perhaps, from the commands of Chevalier La Salle or Lieutenant Tonti, who had found an asylum and graves among the Indians of this distant wilderness. There was one of them, however, whose mission in this part of the New World was widely different from that of his buried associates: the silver cross still grasped by his skeleton hand, the Venetian beads about his waist that had formed a rosary, and the ghastly skull still encircled by a thin band of polished silver proclaimed that here a self-sacrificing disciple of Loyola had expended life in the hopeless work of converting the heathen. These intrusive burials passed, nothing more was discovered until the original sandy surface of the island was reached, and what was there deposited before the great mass of clay had been piled over it was cast aside by the laborers without notice. From the street commissioner who had the work in charge I gained the following meager account of all that attracted his attention sufficient to impress his memory. Ranged along the middle of the structure was a parapet or wall, as he supposed, of rough flag-stones 30 inches high by 3 feet in breadth and 25 feet in length, designed apparently by the ancient inhabitants as a breastwork or rampart for the defense of their town from river approaches. But, on removing the stones, it was found that this work of defense was not a solid wall, but a series of crypts or stone graves, constructed by planting broad, flat stones perpendicularly in the sand and covering them with others of the same kind laid across them. These rude tombs were entirely empty. Not a bone or tooth remained; so great was the lapse of time since the bodies of the honored dead had been laid in these secure vaults that not a vestige of them survived but blotches of dark dust upon the yellow sand. On either side of the primitive coffins, but not contiguous to them, were traces of fire, and with ashes and charcoal were noticed calcined bones, small cubes of galena, and broken flints and pottery. The destruction cf the great mound yielded many rare and fine implements and ornaments of stone and shell, which no one thought to preserve; and no one thought to observe whether they had been interred with the dead at the base of the tumulus or with those buried upon its surface. Among the many relics unearthed, one particularly fine axe of polished stone is remembered, having a groove cut around the middle and a cutting edge on each end; also three pestle-shaped objects of beautifully polished porphyry 20 inches long, 2½ or 3 inches in diameter, rounded at one end and pointed at the other.

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*Smithsonian Annual Report for 1876, p. 438.

Seven miles east of Beardstown, up the Sangamon, and quite near it, at Mound Lake, is a conspicuous landmark known as "the Mound;" a ridge-like elevation 40 feet high by 60 yards in width, and 400 feet in length. This mound has never been explored, and may be of artificial origin; but I am strongly inclined to regard it a natural formation (like the great Cahokia mound and other similar elevations in the American Bottom), merely an outlier of the loess or bluff formation left there in the primal erosion of the river valley. It is situated in the edge of the timber, on the bank of a small lake, 3 miles from the bluffs, and in the midst of the finest fishing and hunting district, even in this day, to be found in Illinois. Whether or not the Indians raised this mound is a question to be determined by future investigation, but there is no doubt of their having used it as a place of resort and camping ground for a great length of time. Although it has been in cultivation for many years, traces of camp-fires are yet seen all over it, and its surface and the adjoining fields are yet littered with potsherds, flint chips, and decayed bones and teeth of wild animals. One of the very few entire pieces of pottery ever recovered in this county was plowed up with some human bones on this mound in the early history of its cultivation. It was a globular earthen vessel, 10 or 12 inches in diameter, marked externally as usual with the impression of the fabric in which it was moulded or sustained while drying. A similar vessel, but smaller, was plowed up unbroken in a field a few miles east of this place a few years later. At a point about midway the lake-side base of the mound I discovered, some years ago, the remains of a kiln in which the savages had burned their pottery. It was an excavation in its side, almost circular and 4 feet in diameter, an old-fashioned lime-kiln in miniature, with walls burned as hard as a brick, and the bottom for the depth of a foot filled with ashes, charcoal, and broken pottery.

Nine miles farther east, up the Sangamon Valley and near the bluffs, is another large conical mound, 25 feet high, which has never been examined even superficially. These three mounds, assuming the latter two to be the product of human agency, are all of the first class, and of any class worthy the designation of mounds, found upon the river terraces or bottoms in the county.

The next class of mounds comprise those next largest in magnitude, and are more numerous than the first. They are invariably perched upon the peaks of the Sangamon bluffs, rarely exceeding 8 or 10 feet in height by 20 to 30 in diameter, and are more frequently met of much smaller dimensions. This class of mounds differs from all the others in the peculiar disposition of the remains they inclose. Too few in numbers to constitute the sepulchers of a distinct tribe with an exclusive burial custom, we must conclude that they cover the remains of a class of individuals distinguished from the commonalty for superior ability or merit. The mode of inhumation in mounds of this kind consisted in placing the body or bodies (for they contain from one to six or eight each) of the deceased upon the ground in a sitting or squatting posture, with the face to the east, and inclosing them with a rudely-constructed circular wall of rough, undressed stones, which was gradually contracted at the top, and finally covered over with a single broad stone slab, over all of which the earth was heaped. Though I have carefully examined several of these mounds, I have not yet succeeded in securing from them either an entire skull or earthen vessel, as their inclosed *cairns* are invariably found to have fallen in and crushed the bones and accompanying pottery into a confused mass. Nor have I discovered in them copper implements or pipes of any description, or any object of carved stone; but only a few flint and bone implements, and broken pottery without ornamentation and of very poor quality. Judging from every indication, external and internal, I would conclude that the class of earthworks under consideration were very old were it not for the singular fact that in one of them, a few years ago, the decayed bones of a single individual were found, with a few flint arrow points, a small earthen cup or vase, and an *iron* gun-barrel very much corroded.

The next class of mounds in this county are so numerous and were obviously constructed with so little care and labor that we must regard them as the depositories or cemeteries of the common and untitled dead. They are seen on every knob and ridge of the bluffs and on the hills bordering all of our smaller streams. Seldom rising in elevation more than a foot or two above the general surface, they frequently cover a space of 10 or 15 yards in diameter, and we sometimes find eight or ten of them in a row, along the crest of a ridge, separated from each other by intervals of 10 or 15 yards; each containing the bones of a greater or less number of individuals in different states of preservation. Their repose is often rudely disturbed by the plow, and their human remains scattered over the fields with broken pottery and occasionally flint implements, stone axes, bone awls, and other relics. In many mounds of this class the first step taken in the inhumation of the corpse or corpses apparently was to scoop out from the soil a shallow, dish-like excavation in which the body or bodies—generally several together—were deposited, sitting up with limbs flexed upon the breast; they were then probably covered with bark or other perishable material, as no large stones are ever encountered in these graves, and then covered with earth. In some of them the bones of the dead, in extreme stages of decay, are in great confusion and were buried without definite arrangement or system, somewhat as was observed by Mr. Jefferson in a mound which he describes in his "Notes on Virginia," indicating that in those the skeletons of all members of the tribe who had died within a definite period of time had been collected from the tree-scaffolds, or brought from the tribal bone-house, as was witnessed by Bartram, and laid together in bundles and "covered with a great mount." The chalk-like softness of the bones in this class of mounds tends to confirm the first-thought impression of high antiquity; but this fact alone cannot be relied on as satisfactory proof of their age when we consider that the covering of earth, perhaps not of great thickness at first, has been washed down and thinned by rains, leaving the animal remains but slightly protected from the decomposing agencies of water and frost. In one instance unquestionable evidence of comparatively recent origin was presented. In cutting down a roadway through one of the Prairie Creek ridges, since known as "Indian Hill," in the southwestern part of the county, a broad, low mound was removed and the skeletons of several individuals exposed. With the mingled mass of bones thrown out were found broken pottery, a few stone and bone implements, together with a quantity of glass beads and brass rings of European manufacture. Resting in what remained of the hand of one of the female skeletons was a beautiful pipe of polished serpentine in the perfect form of a squatting frog, of life size, but instead of the usual flat, carved base of the so-called "mound pipes," it had an aperture drilled to connect with the bowl for the insertion of a cane or wooden stem. Some time afterward, at the foot of this ridge, the plow turned up a single skeleton from a mound so small as to have escaped previous notice; and so far advanced in decay were the bones that it was with difficulty I succeeded in partially restoring, by the aid of glue and plaster, the skull and facial bones. The only relics found with this individual, which I judged to have been a female, were a stone frog, probably unfinished, larger than the natural maximum size, without perforations of any kind, and a pipe, representing the head of a fox, both rudely cut out of soft, coarse, yellow sandstone.

In all the interments I have heretofore mentioned the bodies of the dead, so far as I could ascertain, had been primarily placed upon the surface of the ground, or in shallow saucer-like depressions, in a sitting or doubled-up posture; or the dry bones, after decomposition of the flesh, had been gathered in bundles and placed on the ground in piles, and the earth heaped over them in a conical mound of greater or less magnitude. But in some, judging from the better state of preservation of the inclosed remains to be of most recent construction, a different arrangement is observed. The buried skeletons are found on the surface of the ground, but laid at full length on their backs, and surrounded or inclosed with thin broad stones or sheets of bituminous shale, stuck into the ground upright, and probably at the time of interment covered over with poles or bark before the earth was thrown on. This change in disposing of the corpse for burial was, in my opinion, a consequent innovation of the first contact with Europeans; and we have convincing reasons for believing that the old practice of burying the dead *above* ground in mounds of earth or stone prevailed generally among our Indians down to their acquaintance with the whites. Here, as elsewhere, we occasionally find the remains of Indians extended full length in graves *below* the surface of the ground, unmarked by mound or monument of any kind. These comparatively modern graves, copied after those of the white intruders, are, like the mounds, invariably on the high lands; and in many instances the crumbling chalk-like bones can only be identified as belonging to the red race by the implements of stone or shell ornaments associated with them.

Upon the open prairies of Cass County neither mounds nor graves of the pre-historic dead are ever found, and but few of their relics excepting flint weapons of the chase. The Indians no doubt hunted the deer and buffalo and elk on our prairies, but neither lived nor buried their dead there. Their camping-grounds and villages were in the groves along the streams and near springs, and they located their cemeteries upon the adjacent bluffs.

The southern line of this country in its entire length coincides very nearly with a small stream, called Indian Creek, which drains the prairies of a portion of Sangamon County, and, running almost directly west, joins the Illinois ten miles below Beardstown. This creek, too, was the resort of the hunter tribes, and along its banks are still traces of many of their camps and relics of their home life; and on the hills overlooking its valley are the low mound graves of their dead. On a high terrace sloping down to the water of this little stream I discovered, some time ago, the location of an ancient workshop for the manufacture of flint implements. The ground for a considerable space was littered with chips and nodules of flint and broken and unfinished arrow and spear points; and scattered here and there were several water-worn bowlders of granite and greenstone, brought from the drift clay of the hills for use by the early artisans as anvils. In this *débris* a beautiful polished celt of hematite and a few complete flint weapons have been recovered, together with bone punches and awls, and quantities of broken pottery, ashes, charcoal, and fragments of shells, bones, and antlers of deer and elk. Only a few of the Indian Creek mounds have been critically examined, but there is no reason for believing that they differ in any essential characteristic with those of the Sangamon bluffs.

The remains of Indian art found in this country differ but little from similar objects found in all parts of the Mississippi Valley. The race inhabiting this locality before us left no specimen of their work indicating any expression of genius, or any marked degree of skill or proficiency in the common arts of life. The pot-sherds seen in profusion about their old camps and mounds are composed in the main of clay and lime (calcined muscle-shells), but a large proportion were molded from clay alone, and apparently formed parts of small rude ill-shaped and poorly burned vases and cups. The best specimens are ornamented with impressions of coarsely woven fabrics and bark of trees, curved lines, nobs, and indentations, and the marks of finger-nails. In no instance has there been noticed the slightest attempt to produce upon any piece of pottery the representation of the human face or figure, or of any bird or animal. But few of their earthen vessels have survived to the present time; besides the two pots found unbroken, which I have before described, not half a dozen have been secured entire in the whole county.

I have not yet heard of an implement or ornament of copper having been found among the mound remains of the county, and of hematite only the small celt before mentioned; two or three so-called "plummets," several "paint rocks" (or burnt pieces), and some rough blocks of the ore, constitute all of the relics of this material so far known. Occasionally with the bones of the dead are noticed small cubes of galena; and in our collection is a ball of this ore, taken from a mound, weighing a pound and two ounces, which probably did service, enveloped in raw hide, as some form of weapon. No lead, however, has here ever been discovered with any of the aboriginal remains. It is passing strange that the Illinois Indians, so well acquainted with lead ore as we know them to have been, should have never gained the knowledge of its fusibility and ready reduction to metal. Plates of mica are of comparatively common occurrence in our mounds, and in many instances are found to have been deposited upon the breast of the corpse. In one of the small ridge mounds of the Sangamon bluffs a skeleton was uncovered having upon the decayed sternum ten plates of mica uniformly cut to the dimensions of 9 inches in length and 4 wide, with the corners neatly rounded. This mineral is not found *in situ* in Illinois, and of course must have been imported from a considerably remote distance.

Of marine shells no entire specimen of the conch, or *Cassis*, or *Lycotypus*, has been seen in the old graves of our country; but small ornaments and beads made of the columellas and broken pieces of large sea-shells are quite frequently found. In our collection is a necklace comprising 178 pieces of conch shell—each perforated in the center and presenting all stages of finish, from the rough angular sections two or more inches square, to the round polished complete disc two or three lines in thickness and from half an inch to an inch in diameter—which a short time ago was turned out of a low mound by the plow, with the skull and cervical vertebræ of a female skeleton. In another low mound on the bluffs the plow threw out, with a mass of chalky bones, a pint of small sea-shells (*Marginella apicina*), each pierced at the shoulder for the reception of a string to suspend them about the neck or hair. These beautiful little shells are often found in our mounds, and must have been in general use for personal adornment, or as a medium of exchange in the primitive system of commerce and trade. The valves of several species of fresh-water mollusks, especially of the *Unios* and *Anodontas*, were utilized as spoons and knives, and used for digging in sandy soil. Rarely we meet with ornaments cut from them. The hypothesis that our river mollusks constituted a part of the food-supply of the Illinois Indians is not sustained by the presence on our streams of shell heaps of any extent. Fish and game were abundant enough for subsistence at all times, and muscles were in this latitude evidently not considered a luxury.

The long bones of the deer, turkey, &c., were here as elsewhere fashioned into awls, needles, fish-hooks, and punches, and made to do service as handles for stone-tools and domestic utensils. The only ornament of bone (if it was an ornament) the county has yet produced is a broad, flat rib from the carapace of a very large snapping turtle, perforated at each end and ground smooth and polished all over.

Of objects carved in stone but few, besides the specimens I have specifically mentioned, have come to light in this county. Of pipes, a small "mound" pipe from Beardstown and the frog (of serpentine) are the only fine specimens known. In our collection are the fox-head pipe and several coarse, heavy affairs, without beauty or symmetry, which were undoubtedly used for smoking tobacco; and pipes made of clay and burnt are not uncommon. These latter objects were perhaps manufactured after the arts of the whites had been learned, as they are fashioned in the exact shape of common English clay pipes; at any rate, their resemblance to the imported article is so striking as to place their claim to high antiquity in serious doubt. As a rule, the objects carved in stone by the stone-age denizens of this region, exhibit such flagrant deficiency of taste or talent in design, and such low order of skill in execution, that we must conclude the few elaborate and finely-finished specimens now and then discovered here are importations from a distance, secured either by barter or reprisals in war, and were made by a people of higher intelligence and advancements in the arts. Of these exotic relics the porphyry "pestles," the "mound," and serpentine pipes, the perforated weapon of ribbon slate, a discoidal stone of milky quartz, and one of those beautiful perforated "ceremonial" stones of rosy, variegated, translucent quartz now in our collection, constitute all of that class known within the limits of the county. Agricultural flint implements, comprising spades and hoes, are not uncommon in the rich loamy terraces of our rivers, but are generally inferior in size and workmanship to those met with in that portion of Saint Clair and Madison counties known as the American Bottom. The spades are smaller and ruder, and the hoes are plain and without notches for fastening them to handles. The broad hornstone disks, discovered some years ago buried in the sand a short distance above the large Beardstown mound, and which I have described in a previous paper,* are supposed by some archæologists to have been intended for agricultural tools, though never introduced in general use. Of this however we have no positive evidence, and until our knowledge of this class of relics is increased, we must regard that strange deposit as an unsolved mystery.

Celts and grooved axes of granite and various augitic rocks, of all sizes and many patterns, have been, and still are, abundant here. The largest grooved ax in our collection weighs twelve and a half pounds; the smallest, one and a half ounces. Our largest celt, cut from a coarse-grained diorite, weighs eleven pounds; and the smallest, obviously a child's toy, weighs scarcely half an ounce. Flint arrow and spear points, knives, scrapers, and hatchets of the usual forms have been collected in Cass County in great profusion. Hammer-stones, nut-stones, discoidal stones, perforated "talismans" or "arrow straighteners" of ribbon-slate, of basalt, and of fossil wood; stone-balls, plain and grooved; in short, all of the ordinary types of rough and polished stone implements in use by the pre-metal Indian tribes have been and still are often found about our streams and bluffs.

The archæological remains of which I have so far briefly treated are not peculiar to this county or to any circumscribed locality, but are common in all those portions of Illinois and of almost all of the Western, Middle, and Southern States contiguous to water-courses, where the aborigines, with identical habits of life and by identical methods, obtained, with little effort, their food-supplies. And the comprehensive generalization which I have attempted of the antiquities observed here will, with trifling variations and additions, apply equally well to those of other counties and States.

I have yet to mention, however, one object recently discovered in this vicinity, of rare occurrence in the prehistoric remains of this State, belonging to a class so suggestive of savage, ethnic characteristics as to incite interest and thoughtful study. On the crest of one of the highest and most prominent points of the Sangamon bluffs, jutting out from the range into the valley, a promontory, conspicuous for many miles in all directions, was one of the common oval swellings of the surface, usually known here as an "Indian grave," but so overgrown with bushes and weeds and tall grass as to have required close inspection to distinguish it from the natural contour of the hill. The owner of the land, having occasion to build a pasture-fence over this point, set a

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*Smithsonian Annual Report for 1876, p. 438 *et seq.*

laborer to digging holes for the fence-posts;) but when the work had progressed as far as the "grave," the spade barely penetrated the sod at its edge, when it came in contact with a stone, which proved, on removing the soil covering it, to be a rough, flat sandstone flag, nearly square, 3 inches thick and 18 or 20 inches broad. It was thrown aside, and the fence completed. Some time afterwards, on learning that such a stone was found on this point, I concluded to explore the place with the hope of securing a skull or other relic of interest which it may have covered. Investigation soon convinced me that it had not formed any part of the covering of a grave, but had been laid flat on the bare ground. Carefully removing the bushes and earth in which they grew, other similar stones were uncovered, forming together a rude floor or pavement 12 feet in length by 8 in width, somewhat dish-shaped, the center being gradually depressed 10 inches below the edges. The stone first discovered had formed one of the corners of this curious structure. The long axis of the work coincided with the strike of the ridge, exactly north and south; and the flags of which it was made had been carried up from an outcrop of carboniferous sandstone a mile and a half distant, and were rough and uncut, but fitted together with surprising accuracy. They were reddened and cracked, apparently by long continued heat, and the interstices between them were compactly filled with fine ashes. Upon this pavement or "altar" was a mass of ashes, perhaps a foot thick in the middle, and a little more than filling to a level its basin-like concavity. On the surface of this ash-bed I collected fragments of charred bones, constituting parts of three adult human skeletons, among which were considerable portions of three lower jaws, with teeth intact, large pieces of six femurs and pelvic bones, the occipital protuberances of three crania, some bodies of vertebræ, and many small pieces so burned as to be unrecognizable. The fire which consumed these three skeletons had been smothered before it was exhausted, and while yet glowing, as many large pieces of charcoal were mingled with the bones, and the superincumbent earth in contact with the fire was reddened and partially baked. Interspersed throughout the mass of ashes filling the basin were many small pieces of bone and teeth converted into animal charcoal, and bits of flint, perhaps weapons, shivered and broken by the fierce heat of the pyre. I also observed many minute scales of burnt mica and shell, but found no part of any pipe or other object carved in stone, or of pottery. The mound inclosing this weird "sacrificial altar," after the washing of rains and beating of storms for centuries unnumbered, measured but little more than 2 feet high by 20 in diameter. The cracked and fire-scarred stones and great quantity of ashes without charcoal, mingled throughout with fragments of calcined bones, considered in connection with the prominent situation of the "altar," in full view of the valley below and of the highlands around for miles, seem to support the inference that here, at stated times, for a long period, had been practiced the burning of human bodies; or that the remains of a great number of individuals had at one time been consumed until, with the three last victims, the fire was suddenly extinguished by heaping over the seething mass the earth that was to keep the story for the coming of another race. We are warranted in believing that all tribes of Indians inhabiting this great valley, from the remotest times, executed by burning certain captives taken in battle; but we have no evidence that dish-shaped platforms of stone were constructed especially for that purpose. The simpler method of securing the doomed wretch to a stake or tree and there slowly roasting him amidst the wild jeers and exultations of the captors is far more consonant with well-known Indian nature and usages. But for the absence of collateral testimony the hypothesis that so-called "altars" of this class were made for the purpose of incinerating, at stated periods, the remains of the dead of the entire tribe, collected for such disposal from tree-scaffolds or bone-houses, would present many elements of plausibility. It is possible that a single tribe may have so cremated the skeletons of their deceased kinsmen before making their voluntary or compulsory exodus from this locality; but observed facts fail to sustain the idea that such a mortuary custom prevailed here generally at any time or among any people. We have the authority of La Hontan that the Indians of the Lower Mississippi "burnt their dead, keeping the bodies until they had accumulated" sufficiently in numbers for the grand ceremony, which was performed in certain places remote from their villages. But Du Pratz, whose opportunities for observation and sources of information were equal if not superior to his, positively asserts that "none of the nations of Louisiana were acquainted with the custom of burning their dead." Had this custom been in vogue to any considerable extent or for any considerable period of time it is plain that cinerary altars would be numerous and sepulchral mounds exceptional. In Cass County and the State of Illinois, so far as my knowledge extends, this strange monument is unique and without parallel among thousands of Indian mound-graves, a mystic expression, it may be, of religious fervor or superstitious frenzy.

The intrinsic evidence of many prehistoric remains of this county sustains their claim to extreme antiquity, but no work or specimen of art of a former race has yet been found here above the capacity or achievement of the typical North American Indian. And in studying the life, habits, and burial customs indicated by these relics, I can see no necessity for ascribing them to the agency of a distinct or superior race, when they express so unmistakably the known status of Indian intellect.

ANTIQUITIES OF JACKSON COUNTY, ILLINOIS.

By G. H. French, *of Carbondale, Ill.*

Among the many objects attesting that Southern Illinois is part of a region once inhabited by a race of people about whom comparatively little beyond conjecture is known, the various mounds and cairns form a conspicuous part. The exploration of one of these structures was the subject of two visits by Dr. E. B. Chapin, a resident of this place, and myself on the 3d of April and the 3d of June, 1878. The mound is situated on the farm of E. M. Norbury, about 3 miles south of here, and is about 40 rods west from the Illinois Central Railroad, on a hill that forms a spur from a comparatively level area of land back a little from a creek on the south, and just in the edge of a piece of second-growth oak timber. Situated as it was on the point of this hill, it was difficult to judge at first of either its height above the natural ground or of its size; but subsequent examination showed that it was, in its highest part, about 3 feet above the original ground, and it appeared to be 25 or 30 feet in diameter. We found, however, that inside these limits was a series of stones that seemed to have been placed around the base of the mound to hold the dirt in position as it was heaped up, and as the elements in time had removed the dirt from the higher parts and spread it around and beyond these stones they had become partly or wholly covered up, while the extent of the structure was increased. If this theory is correct, and the position of the contents of the mound seemed to indicate that it is, the mound was originally oval or nearly oblong, and measured 12 by 15 feet in its shortest and longest diameters.

For 2 or 3 rods to the south and for 20 or more rods to the north and northwest, chips of flint were abundant, both mingled with the soil and on its top. The same soil and flints mixed with broken bits of pottery formed the general substance of the mound. These seemed to indicate that the immediate vicinity had been the site of an Indian workshop and perhaps camping ground. In the time when this ground was covered with the primeval forest the small branches only a few rods to the east and west would have afforded them water most of the year, if this locality ever formed a permanent place of abode; while the creek, from 50 to 80 rods to the south, would be the unfailing source when the heats of summer had dried up the others. Several other facts seemed to point to this as having been for them a central position. Across the creek, that is to the south, and 80 or more rods on the other side, in a southwesterly direction, was a stone mound that we also explored, but found no remains of any character either in or about it. It seemed to be simply a monument of direction as much as anything we could discover, an irregular cairn of stones in such a position that the natural contour of the land would indicate there might have been here a trail, but all other marks are now obliterated. Still further to the south, but whose exact position I did not learn, are several other mounds, which I think have been more or less explored. To the southeast, at a distance of 5 or 6 miles, is a structure known now as "Stone Fort," that is supposed to have been constructed by the Indians, and probably for defensive purposes. This is, or evidently has been, a wall across the neck of a projecting point of rocks, though it is now but a long pile of stone as though a wall had been demolished. Northwest from this mound, some 12 or 15 miles west of Carbondale, are other mounds, while north or northwest of these are others, as though forming a line with those that have been found within the vicinity of East Saint Louis and Alton. All these facts seem to bear more or less directly on the idea that at some time this locality had been a place of general work and resort.

The central part of the mound had been more or less disturbed on top by having been a place where brush and other refuse had been burned, and where hogs had lain and rooted, but it was claimed by Mr. Norbury, the owner of the place, that other than this it had not been disturbed. As intimated before, the mound was composed of the natural black surface soil of the place mingled with chips of flint and broken pieces of pottery, the latter red, the flint of a blue kind, and in all shapes and sizes, but we found no arrow-heads or other implements of the same kind of stone. We found only one arrow-head, and that was of white flint, regular lanceolate shape and about 3 inches long. The pieces of pottery were all small and of irregular shapes. The only implement found, other than the arrow-head, was a thong-gauge, about 3 inches long by about an inch and a half wide, with two gauge-holes and a slight depression on one side between the holes as though a place for the thumb when used. This was composed of either red stone or pottery; I am inclined to think the first, as it seemed to be too compact for pottery, or at least more so than the broken pieces found.

In the northwest part of the mound was found a skeleton in a horizontal position lying on the back with the head towards the northeast, and about 3½ feet below the top of the mound. The bones were so decomposed that it was with difficulty that a whole one of any part of the skeleton could be taken out without breaking and crumbling, though while in position the shape of the skull indicated that it corresponded with those taken from other mounds at Sand Ridge, this county, and other points in the vicinity.

No other complete skeleton was found in the mound, though pieces of human bones representing nearly all parts of the skeleton were scattered through different parts of the structure, together with the bones of other animals. Of these we could recognize the lower maxillary of deer and the atlas of a bear, but the rest were too much broken to be identified. Besides these there were a few land-shells, a species of helix, and a few broken salt-water shells, perhaps of some species of unio. The scattered human bones were all of them more or less broken, the breaking seeming to have been done when the bones were fresh. In one or two instances only were we able to find the different pieces of the same bone. In one case a femur was broken into three pieces, the head and two parts of the shaft, and these were 2 or 3 feet apart. It may be stated here also that these scattered human bones, the flints and broken pieces of pottery, together with the shells and bones of animals, were all of them above the depth where the skeleton was found, as though they were mixed with the earth of which the mound was built. We could account for this in the following manner: The chips of flint, shells, bones of animals, and the scattered human bones were on the surface when the burial took place, and after the body had been placed in position the dirt on the surface that could be the most easily obtained was gathered up together with whatever was scattered over the surface. Of this the mound was built, and, from what we know of the habits of the Indians of the present, it takes but little imagination to form a picture of the squaws gathering up this material in their baskets and carrying it to the place where it was wanted. This would imply that the people who did the burying were cannibals, and the broken character of the scattered human bones would in a measure substantiate that view.

A STONE FORT NEAR MAKANDA, JACKSON COUNTY, ILLINOIS.

By G. H. French, *of Carbondale, Ill.*

In company with Prof. A. C. Hillman and Mr. John Martin, one of our students very much interested in natural history, I visited Stone Fort, near Makanda. This place is situated in township 10 south, range 1 west, of the third principal meridian, on the east side of the Illinois Central Railroad, and is about three-fourths of a mile, by road, northeast from the village of Makanda. The country here is very hilly and rocky, Makanda being situated in a gorge, through which the Drury Creek runs. North of Makanda, where the road turns east, is a side gorge, through which runs a small tributary stream of the Drury, more or less lined with rocky bluffs on both sides. The surface beyond the bluffs in some places slopes upward; at others the bluffs are nearly as high as the general elevation of the surrounding country. On the west of a bluff known as the Stone Fort another smaller stream comes down between the bluffs. It is now nearly dry but is well filled with water in times of freshets. Stone Fort is a ledge of rocks projecting out as a rounded point from the northern and eastern side of this second gorge, more toward the stream than the general course of the bluffs. On the southern face the bluff is 125 feet high. Across its neck above extends a pile of stone, running east and west, which gives the place its only importance archaeologically. This pile of stone is about 280 feet long, and on an average 2 rods wide, and in the middle is about 30 inches high. The distance from the front face of the bluff to the middle of the stone wall is about 300 feet. The lengths were obtained by pacing, and the width and depth by tape-line. The middle of this inclosed space is from 15 to 20 feet higher than the edges, the slope being gradual. The whole space is covered with trees similar in size and appearance to those on the tops of the other bluffs. All around the bluff, from the front or south face to the east and west, the rocks are either perpendicular or overhanging; but on both sides back of the line of piled stone the top may easily be reached, as the distance from the summit of the bluff on its southern face to the more nearly level ground below decreases toward the north, being perhaps 50 feet at the eastern and 25 feet at the western end of the stone wall. This pile of stone across the neck of the bluff shows evidence of having been a wall. To see if there were any signs of regularity in its structure, and upon what base it had been constructed, we took out a cross-section of the stone in one place where they seemed to have been thrown down, and partial sections in several other places. First, the materials are sandstone, the same as that of the bluffs. Many of them are flat, all irregular, just as would occur in breaking up that kind of stone. In size they vary from some smaller than a man's head to those as large as one man can lift. They are built upon the ground and not upon the ledge of rocks, as the earth beneath the pile is the same as that constituting the top of the bluff, save that here there is no vegetable mold. Most of the larger stones are placed where was the base of the wall, seemingly with but little regularity. At the ends, where the hill is a little steep, the flat stones at the bottom are set on edge, and the next course so laid that its top surface would be nearly level, or sloping a little up the hill. This, of course, would make it easier to lay the succeeding stones. Where these stones came from is hard to tell. If there were only a few of them one might conclude that they were picked up from the surface of the inclosed area south of the wall and on the open space north of it. But there are not stone enough on the same area of the tops of the other bluffs to make such a pile. Part of them may have been obtained in that way and the rest brought there from above, where this bluff is not very high.

The question "why they were placed there?" seems to admit of but one answer—they were a means of defense. The fact that it has been known as Stone Fort ever since the country was settled implies that such has been the general opinion of the people acquainted with the place. It has been assumed, however, that it was the work of hunters for the purpose of a protection to their camp. I can hardly conceive that a party of hunters, for a temporary camp, would go to the trouble of gathering such a mass of stone as is represented in 280 feet long, 33 feet wide, and, on an average, 1½ feet high. It may have been the location of an Indian encampment in some former years, and built by them as a protection from their foes, and used very much as Starved Rock, on the Illinois River, was by the Illinois Indians.

The question will occur, where did they obtain their water for domestic purposes? On the west side, just within the end of the wall, there is a deep, narrow fissure in the rocks, down which one man at a time might go; and it is only a few feet from the bottom of this fissure to the stream that comes down the rocks. Evidently there is always a little water here, and it is quite palatable, as we found by trial. This may have been their mode of egress and ingress to the inclosure.

We found very little remains of the former occupants. At one place beneath the stones, evidently just south of what was the south side of the wall, we found a broken arrow-head of white flint, the only relic discoverd in the inclosure. We did not dig into the ground, either south or north of the wall, not seeing any elevation that looked like a mound. I would add further, in relation to the bluff, that the fissure just spoken of, inside the western extremity of the wall, is the only place where it is possible to reach the top from any point south of the wall.

That it was a place of refuge from any body of men using fire-arms does not seem probable, for the following reason: In addition to the evidence which the broken arrow-head affords, the bluff to the south, across the creek, is considerably higher than this one, and is within range of a rifle, but would not be within arrow-shot. This, and the fact that there seems to be no tradition of the building of the wall, would lead us to conclude that it antedates the white settlements of this region. It is not far from a number of Indian mounds to the north, or a little west of north, that seem to form a nearly continuous line with others still farther north. One of these mounds I opened in 1878.

ANCIENT REMAINS NEAR COBDEN, ILLINOIS.

By F. M. FARRELL, *of Cobden, Ill.*

Along the range of sandstone bluffs that traverse Southern Illinois running eastward and forming the water-shed between the tributaries of Big Muddy River on the north and Cache River on the south, and from 16 to 20 miles east of the Mississippi River, I have been making a few discoveries which prove that the sheltered nooks formed by the projecting cliffs were the favorite abodes of an ancient race that once peopled the Mississippi Valley.

The first place investigated is 2 miles east of Cobden, Ill., under a projecting cliff of sandstone (millstone grit) about 60 feet high and facing the east.

Around an ancient fire-bed, not more than 1 foot below the surface, in a loose, porous clay, were found charred bones, flint chippings, fragments of arrow-heads of very rough workmanship, fragments of rude pottery made of red clay, and fine gravel. The pieces were half an inch thick, or nearly so, and, judging from the curve, they may have been of considerable size.

One morning in March, 1880, a party of us went to the bluffs known locally as Buffalo Gap, a deep triangular hollow, inclosed on two sides by immense ledges of stone, towering high above the tree-tops, and projecting far over the base, and forming sheltered nooks which bid defiance to the storms of winter and the heat of summer.

All along the base of these rocks the ground is strewn with flint chippings, bones, bits of pottery, arrow-heads, rocks, and rubbish. We made excavations in several places, and to various depths, varying from 1 to 3 feet.

The earth is dry and loose, and composed of considerable vegetable matter, and has the appearance of having been forming slowly for ages. All through this dust we found bits of pottery, arrow-heads, charred bones, charcoal, bones split lengthwise to extract the marrow, mussel-shells, turtle-shells, deers' horns, bones and jaws of various kinds of mammals, a bunch of charred hay, a large limestone mortar, having a bowl nicely cut in the center, which was circular in form and 1 foot in diameter, and deep enough to hold about a gallon. On a fire-bed 2 feet from the surface were the fragments of an earthen pot, probably a cooking vessel, as it contained bones and a fragment of a deer's upper jaw; also other material, which we were unable to determine. Near this pot were numerous spherical bodies, resembling spice in form, white, hollow, and too fragile to be preserved.

The pottery has markings on the surface like the impression of grass, twine, and sometimes small sticks, showing that the vessels were molded in some kind of woven sack or basket made of willows and twisted grass. Some of the fragments were smooth and thin, the coarser ones one-half inch thick, and made of pounded mussel-shells, small gravel, and red clay. The shells which were found were probably brought up for that purpose, the animal having been used for food. The arrow-heads are rude and very poor compared with the field specimens of which I will speak later.

An old fort is near by, on top of a cliff, and cut off from the main land by a wall of stone, which is now nearly flat, covering a base 20 feet wide and about 150 feet long. The fort is triangular, the wall making one side and the perpendicular rocks below forming the other two sides. It had but one point of access from below, which is a path up a crevice in the rock, and could have been easily defended from above. This has the appearance of being very ancient.

Near the Illinois Central Railroad track, 5 miles north of Cobden, are other large bluffs, and underneath are numerous beds, which have afforded a great many relics. Several human skeletons have been unearthed, more or less preserved, though usually badly decayed, but one skull (female adult) was nearly perfect; forehead small, domestic faculties largely developed. The body of an infant was found near this one.

Besides human skeletons, bones of a good many kinds, though mostly deers' horns and bones, bones split lengthwise, large numbers of mussel-shells, turtle-shells, broken pottery (some of which must have been large), a considerable amount of parched corn, and the impression in the earth of woven fabric, which is rare here. The arrow-heads are numerous but of a rude character. Several fine bone awls were found. This seems to be the richest locality yet discovered here.

Near Makanda, 3 miles north of this place, is an old fortification, called Stone Fort, as it has once been defended by a stone wall, which is now nearly demolished.

Field relics.—Near all large springs implements of stone are found more numerous than at other places. They are of fine workmanship usually, and of various forms. The arrow-heads are of flint, of all colors. Shovels from 4 to 15 inches long have been found. Celts are of greenstone, handsomely polished, from 3 inches to nearly a foot long. Greenstone hatchets, having a groove for a handle, are found of various sizes, and well made. I have two in my possession, weighing 1½ and 2½ pounds, respectively, though some found here will weigh probably 5 pounds.

Workshops.—Three miles west of Cobden, near Kaolin Station, on the Saint Louis and Cairo Railroad, is the most extensive workshop I have found. It covers several acres of ground, and car-loads of flint chips and bowlders are strewn everywhere. Four miles south of Cobden is another of less dimensions. Others of greater or less size are met with in various parts of the country, but no relics of much value are found with them.

Aboriginal burial.—Seven miles west of Cobden, in Union County, Illinois, near Clear Creek, on the farm of Adam Smith, is an aboriginal cemetery. It is situated on a hillside facing the south. The graves are in a group, and were probably arranged according to some plan, but the spot has been in cultivation fifty years, and the graves are sadly mutilated. Each grave contains a single individual. The bodies were stretched out at full length. Of the two that were examined one was lying with the cranium to the west; the other toward the north; the face of the one toward the rising sun; the other facing the noon-day sun. The remains were inclosed in sarcophagi made of thin slabs of white sandstone, which were probably quarried from a ledge about three-fourths of a mile distant, in the bank of Clear Creek. The bones were (except the teeth) nearly decomposed. The graves were scarcely a foot beneath the surface, and mostly disturbed by the plow.

The mounds 7 miles below Jonesborough, Ill., have afforded many valuable relics, including numerous perfect water-vessels and other pottery, arrow and spear heads, celts, hoes, hatchets, pipes, skeletons, and one stone idol made of stalactite. These mounds have been investigated by F. M. Perrine, of Anna, Ill., who has a fine collection of mound and field relics.

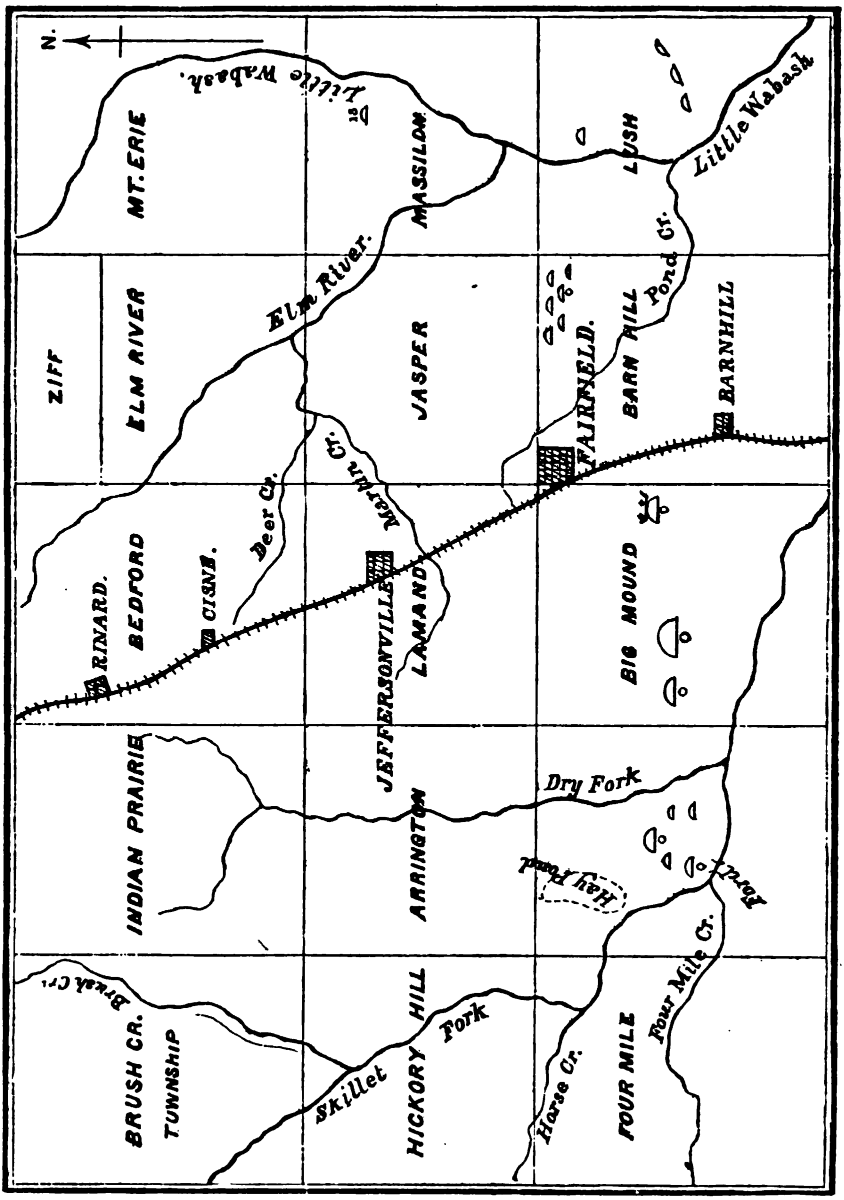
ANTIQUITIES OF WAYNE COUNTY, ILLINOIS.

By H. F. Sibley, *of Fairfield, Ill.*

Wayne County is one of the larger counties of the State, located on the southern border of the prairie region. At least three-fourths of its surface was originally timbered land. The prairies are generally small. The principal streams are the Little Wabash and Elm Rivers and the Skillet Fork (a branch of the Wabash). The surface is generally rolling and elevated from 50 to 125 feet above the stream beds. The Wabash and Skillet Fork bottom lands are generally rather low and flat, with the exception of some few ridges of high land, ordinarily lying parallel with the watercourse. On the ridges generally we find the ancient tumuli of the Mound Builders. One of the most prominent places of ancient resort in our county was a ridge in the Skillet Fork bottom, now known as Fleming's Ridge, in Arrington Township. (See map.) The ridge commences at the river and runs almost due north to the prairie, and is from one-half mile to one mile wide. Near the south end of the ridge, about one-quarter to one-half mile from the river, is a group of mounds, seven or eight in number. Several farms have been opened up, and mounds are found all over the ridge. Two of them have been explored and the ordinary fragments of pottery, shells, human remains, &c., were found, but all seem to have been disturbed. Just to the southwest of the ridge I have drawn a half-moon-shaped figure for a pond, or rather where a pond had been, but which has been drained for the fish. It is now known by the name of the Horseshoe Pond from its peculiar shape. It was probably an artificial fish-pond built by the Mound Builders, as it fills up when the river is high, but can easily be shut up even during high water. Southeast of the ridge are two more mounds, about 100 feet long and 50 feet wide, and now 6 or 7 feet high. One of them was examined, and in it were found some flint arrow-heads (very rude), an immense number of turkey and wolf bones, together with deer-horns, &c., which seemed to have been thrown into fire, some of them being partially consumed. Human remains were also found, as well as some broken bits of pottery. There seemed to be no line of separation.

In the southwest corner of Big Mound Township are three mounds in one group which have never been examined. Northwest and near to them are two more, of which one was examined, and in it were found rude arrow-heads, broken pottery, &c., but could not get a skeleton in any state of preservation at all, so as to determine how they were buried.

On the east edge of the township, some 2 miles south of this place (Fairfield), are two mounds, one of which was slightly examined, and found to be a burial mound. One mile farther south, almost right in the center of Little Mound Prairie, is a natural elevation, topped out by the Mound Builders into a cemetery that can be seen for a long distance. It was the burial-place of hundreds who are interred in the stone cists, of which numbers have been examined. Axes, arrow-points, &c., used to be found in abundance in the vicinity, but they are now

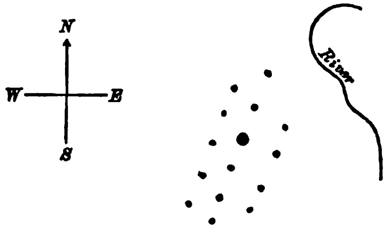


about all picked up. In Barnhill Township, 5 miles east of us, is a group of seven mounds, which have not been examined, but which were probably dwelling-places. They are small, about 90 feet in circumference, and from 2½ to 3 feet high. In Leech Township, on the west side of the river, is a group of six mounds, which have not been examined; neither has the one which is on the east of the river at the Iron Bridge, where the stage road crosses the stream. About one mile east and one mile south of the bridge are three mounds, standing as shown on the map, one of which was examined, and found to be a burial mound. About 100 yards southwest of these mounds is a pit 10 or 12 feet square and 7 or 8 feet deep, and within 6 or 8 feet of the river bank. It has never been examined. One of the old men in the vicinity told me he had noticed it every year for a long time, and says it is not nearly so large as it used to be. Just below, at the mouth of the Pond Creek (on the west side of the river), is a square inclosure, said to be 100 yards or more square, called the Old Fort, but I have not seen it. In Massillon Township is a group of seven or more mounds, as shown on the map. It is a very high bluff, and has been a famous place for the ancient race. It is a good fishing and hunting locality, the river at that point containing a shallow rapid or riffle, and just across the river on the east side is a low, flat, bottom land, stretching around for miles, and has been one of the choice spots for game.

In the northeastern part of the county are two mounds, which, from the description given, must be the largest in the county, being 60 or 80 feet high and wide in proportion, but they have never been examined.

Our mounds, as a rule, do not at all compare with those on the Ohio River, about 60 miles south of us. They are small and scattered, and are generally found in groups of from 3 to 20. I must not omit to mention that there are a number of mounds outside of Wayne County, situated on the bank of a river in White County. I have never been to see them, but I have been told that they number between thirty and forty, all in a row and following the trend of the river. Throughout the county generally are found more or less of the stone implements, but they are much more plentiful near the streams and in the timbered lands, and are scarce on the prairie.

In the Smithsonian Report for 1876 (page 436) is cited a remark of Messrs. Squier and Davis relating to the disks of black flint. There have been two deposits found in this country, one in the county south of us (White), and one in the county west (Jefferson). The first one contained thirteen of them, of which I obtained eight, and the other contained forty-six, of which I obtained several. Speaking of the disks, on page 440 (1876), it is said: "Thus far not one of them has been found isolated or bearing marks of use." This is a mistake, if mine are of the same kind as those spoken of by them, as I have found three in this county, one at a time, and one of them not quite twice the size of a trade-dollar. They are of the same stone and the same shape, &c., but none bear marks of use. In addition to those given above, fifteen more mounds have been found in Massillon Township. They are on the west side of the river, about one inch (as measured on the map sent) from the north line, on a high bluff, hardly a quarter of a mile from the river. They are somewhat in this shape, the largest mound being in the center.



The mounds in Barnhill Township, just east of Fairfield, are seven in number. They were explored two or three years ago, but nothing but charcoal was found in the bottom. I have inquired of the man living on the farm, but he does not find many tools, &c. The mound in Big Mound Township marked is 3 miles from here. It is, probably, a large natural mound on the prairie, to which dirt, &c., has been brought from other parts, and so completed the cemetery. There are many graves, and several bodies or parts of bodies appear to be buried in one grave, but they are so decayed that no perfect skulls can be obtained. The graves are made by building the side and end walls of a hard sandstone, with a large one for the bottom and one for the top. The stone could not have been obtained nearer than 7 or 8 miles, on the Skillet Fork. Two trees are growing on the mound, one of them a catalpa and the other an oak, both of which have been planted, beyond a doubt. The catalpa is found in abundance in our river bottoms, but there are none on the upland. The other two mounds in the same township are also large, and located in the bottoms in the woods. One of them was found to contain human remains and a few broken pieces of pottery, but nothing of value. The other contained human remains, but not in any order of arrangements; also river shells, deer-horns, wolf jaws, &c.; also much charcoal and many small stones occur among the mass. The group of mounds in Four Mile Township is near the Skillet Fork. The one in the southwestern corner, marked "Explored," has been plowed over a great many times, and evidently contained human remains and flint tools. The second one above it was explored this spring, but not very thoroughly, as it was very warm and the woods dense. Human remains were found, and one broken piece of pottery, too small to tell its shape, and one flint arrow-point. The pottery was different from any I have ever seen, of bright-red clay and small pebbles. There are probably a great many mounds about 12 or 15 miles from here, in the woods, all of which are built on what is called Fleming's Ridge, mentioned above. Probably the Mound Builders settled on the same ground for this reason: the best ford on the river was just south of the mounds, in fact it is the only place I know of where it can be forded at all for miles. The place marked "Hay Pond" is a low place that used to be a kind of lake, which was drained by the inhabitants to catch the fish. The mound in Leech Township (on the north) is near my dwelling. Those south of it are three in number, situated as indicated in the drawing. Right on the bluff is a square hole 10 or 12 feet in diameter. All of these mounds are unexplored. The square hole used to be much deeper than it is now, about 5 to 7 feet.

MOUNDS AND EARTHWORKS IN VANDENBURG COUNTY, INDIANA.

By FLOYD STINSON, M. D., *of Evansville, Ind.*

On the 3d day of June, 1876, I visited Mathias Angel's farm, situated 6 miles southeast of Evansville, where I found six mounds, four distinct cemeteries, three lines of earthworks, one large stone cist, and one altar.

The first and most western mound is 15 feet high, 585 feet in circumference, truncated, and 100 feet across the top. The second mound, east-northeast of this, is 8 feet high and 150 feet in circumference. This had been dug into by Charles Artes, who found in it some human bones, burnt earth, charcoal, and ashes. Near this mound I found a stone cist, which was 8 feet long, 4 feet wide, 4 feet deep, walled with slate. In this were found several skeletons. Nearly north of this is a third mound, which is 20 feet high, 402 feet in circumference, truncated, and 60 feet across the top. On the top of this mound, just below the surface, was burnt earth. Forty yards from this I found a remarkable altar. The roof, which was sand rock, was plowed off; the sides and ends were slate, 4 inches thick; the floor the same as the roof rock. Inside it was 3 feet long, 2 feet wide, and 14 inches deep. The contents of this altar were first earth, then one-half peck of burnt and charred bones, charcoal, and ashes. Part of the bones were human, (the patella and head of the femur). Beneath this was burnt earth, and below that, earth. I have in my cabinet part of the contents of this altar.

East-southeast from the second mound is a fourth mound, which is 150 feet in circumference and 4 feet high. To the east of this is one of the most remarkable mounds I ever beheld. It is 100 yards long, 100 yards wide, and square; consequently it is 400 yards around. It is 45 feet high to a plateau, the width of which is 185 feet. Then at the southeast corner, on the top, there is an additional mound, 15 feet high, which would make a mound 60 feet high. Then at the west end there was an elevated platform 4 feet high, 150 yards long, 55 feet wide. I will designate this as the fifth mound. East and west of this great mound are burying-grounds. All of the graves in this section are walled with slate. East of this again is a sixth mound, which is 10 feet high, 30 yards in circumference. Around these six mounds is a line of earthwork, resting at either end on the river bank, and inside of this are two other short ones. The outer line is about 1 mile in length. The middle and inner lines are about 2½ feet high, and about every 40 yards there are mound-like widenings on the outer edges. One-half mile northeast of these mounds is a mound 50 feet high and 164 yards in circumference.

EXPLORATION OF A MOUND NEAR BRACEVILLE, TRUMBULL COUNTY, OHIO.

By S. N. Luther, *of Garrettsville, Ohio.*

Recently, in company with Mr. C. Baldwin, I explored an ancient mound on the estate of the late Nathan Humphrey, esq., situated one-third of a mile southeast from the center of Braceville, Trumbull County, Ohio. Miss E. B. Humphrey, who now has charge of the estate, informed me that the mound was formerly covered with a growth of heavy timber, which was cleared from it by her father many years ago, and that grading and the process of cultivation have reduced it from not less than 10 feet in altitude to its present height of 4½ feet. It is situated on a terrace a few feet above the alluvial bottom of the Mahoning River.

The length due east and west is 75 feet, and the breadth about 60 feet. It is elliptical in form, composed of the dark sandy loam which surrounds it, and in several places has been considerably disturbed by previous explorers and by the burrowing of woodchucks. We commenced by digging trenches from the east and south sides toward the center, somewhat below the base of the mound. In the eastern portion we found the remains of five bodies, a short distance from each other. Except the crania and fragments of the long bones, nothing could be saved, barely enough remaining to define the position in which they lay. Of the crania two were saved in fair condition. With two others we were not so successful, though enough was preserved for several measurements. The fifth was so frail that no portion of it had escaped decay. The bodies were usually buried with the head to the west, though in one case this order was reversed, the head lying to the east. Near the latter were a quantity of very bright-red ocher, pieces of pottery, and at a short distance a stone pipe of peculiar construction. Many bright fragments of stone, a few arrow-heads, and flakes of chert were found in the process of excavation. Throughout the undisturbed portion of the base, and about 1 foot from the original soil, a very hard layer of earth was discovered, 2 inches in thickness, beneath which were the skeletons. It is stated that a tier of skeletons were obtained by removing the upper part, and that many relics have been secured, but the persons who made the excavations being inaccessible, I cannot obtain authentic information of their observations.

Measurements of the crania.—No. 1, the best preserved skull, is that of an old person. Length, 7.05 inches; vertical height (inside measure), 4.92 inches; occipito-frontal arch, 13.09 inches; parietal diameter, 5.68 inches; horizontal circumference, 20.35 inches; cephalic index, .8056.

No. 2 is that of a young person (the wisdom teeth only partly through the process). Length, 6.90 inches; vertical height (inside measure), 5.10

inches; occipito-frontal arch, 14.45 inches; parietal diameter, 5.45 inches; horizontal circumference, 20.25 inches; cephalic index, .7898.

No. 3. Length, 7.07 inches; vertical height (inside measure), 5 inches; occipito-frontal arch, 13.30 inches; parietal diameter, 5.45 inches; horizontal circumference, 20.50 inches; cephalic index, .7708.

No. 4. Length, 7 inches; parietal diameter, 5.70 inches; cephalic index, .8143.

Three-fourths of a mile west of Hiram, Portage County, I examined a stone structure to which my attention had been called several times by persons who supposed it to be a place of burial. On viewing it, I found an annular pile of sandstone nearly 3 feet high, inclosing a space 10 feet in diameter, with an outer diameter of 25 feet, making a wall 5 feet in width. When the center was excavated, ashes and charcoal were found to the depth of 3 feet, the wall showing the action of much fire. The entire absence of bones and other kitchen refuse, with the elevated location, led to the inference that this was a signal station. It is one of the highest points on the Western Reserve, and commands a view of over 30 miles to the east, and also a portion of the Cuyahoga River on the west.

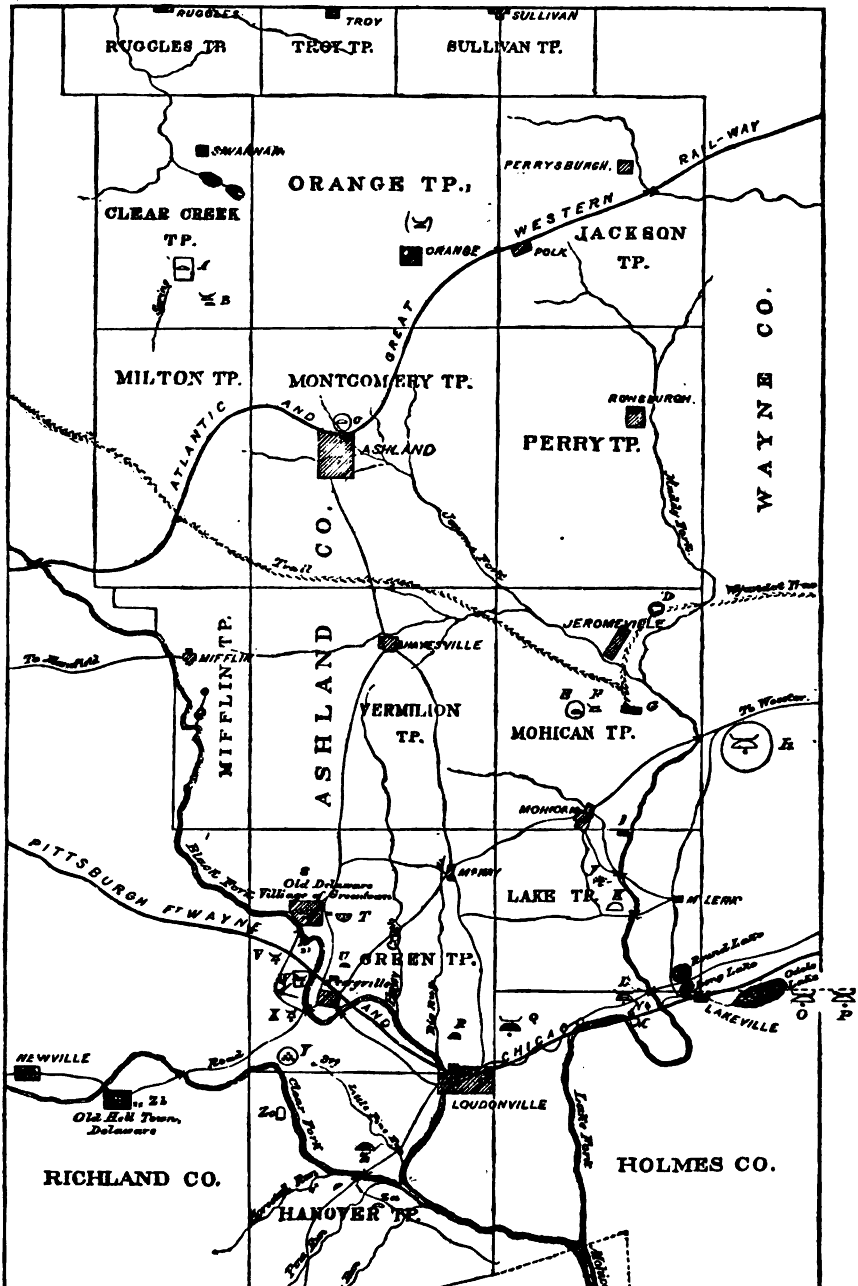
There is quite an important cemetery in the extreme southeast part of Geauga County, 2 miles southeast from the village of Parkman. The graves were mostly constructed of flat stones, placed on edge at the sides and ends. They are paved and covered with the same flagging stones found at the Grand River, which is not distant. Over these were piled loose stones. The location is a side hill, with a descent to the east. In one place the graves extended several rods up the hill in a line, in such a manner that the foot of one grave made the head of the next, and were all covered by a continuous pile of loose stone. This burial-place has been almost entirely despoiled by the persistent efforts of relic-seekers. I can learn of no implements of special interest that were found here. Those obtained consist of the commoner forms of chert, with celts, grooved axes, &c.

DESCRIPTION OF MOUNDS AND EARTHWORKS IN ASHLAND COUNTY, OHIO.

By H. B. Case, *of Loudonville, Ohio.*

The accompanying map locates nearly all the mounds and earthworks in Ashland County, Ohio. Each one is indicated by a letter, and opposite the same letter in the text will be found a description of the work.

A.—This square inclosure with the gateway to the southwest is situated in section 36, Clear Creek Township, on the line between the northwest and southwest quarters of the section, upon land owned by John and Thomas Bryte. It is about 400 feet long by 200 feet wide, and has a gateway at the southwest corner near a very strong spring. In 1824 Mr. Bryte commenced to clear his farm. The embankment at that time was from 3 to 4 feet high and 10 feet wide at the base. Both the em-



bankment and the area were covered with large oak trees. The place now goes by the name of Bryte's Fort.

B.—Two mounds stand upon a high natural elevation (90 feet) covering about 5 acres at the base, and being about 60 by 90 feet on the top, which is nearly flat. Each is 25 feet in diameter and 4 or 5 feet high. They are situated on the northeast quarter section 35, Clear Creek Township. At least one of them was explored as early as 1844, by Thomas Sprott and brother, who found a number of human skeletons in a kind of stone cist, upon which was almost a peck of red Indian paint. The bones were replaced.

C.—A circular inclosure containing 2 acres, more or less, is situated just north of the Atlantic and Great Western Railway, and within the city limits of Ashland. The farm was formerly owned by Henry Gamble. In 1812–'15 the first settlers found embankments from 3 to 4 feet high, and from 8 to 10 feet wide at the base. A forest of oak, hickory, sugar, and ash grew upon and near this work. It overlooked the valley to the south and east, and had a gateway at the southwest opening near a fine spring. The site has been plowed for more than fifty years; and scarcely a trace of it remained in 1878.

D.—At this point is a circular inclosure located near the north line of the northeast quarter section 9, Mohican Township, one mile east of Jeromeville.

E, F.—On the farm of Nicholas Glenn are a mound and an earthwork. Information might be obtained from John Glenn, jr., or from William Gondy, an old settler, both of whom live at Jeromeville, Ohio. The works are about 2 miles southwest of Jeromeville.

G.—The Mohican town called Johnstown was located here. In the years 1808–'10 it contained Delawares, Mohegans, Mohawks, Mingos, and a few Senecas and Wyandots. Captain Pipe, a Wolf Indian, ruled the village until he left it, in 1812.

H.—This large circular inclosure and burial mound are situated in Wayne County, just south of the road leading from Lake Fork to Blatchleysville, and just east of the road leading from McZena to Blatchleysville. These remains are upon a high, gradual elevation overlooking a vast range of prairie, northeast and southeast, as well as the valleys westward. The circle is a little less than one-third of a mile in circumference. At present the embankments are from 1 to 2 feet in height. The area and embankment are covered by the forest growth, which is not older than 60 or 70 years, the Indians having burned this region annually until about 1812, for the purpose of hunting. Years ago the mound was opened by unknown persons. In 1876 the author visited it, and found that an animal had burrowed into it and brought out a fragment of skull, which is now in his possession. Some time after, Mr. Thomas Bushnell, of Hayesville, made excavations in the mound and found only bones, among which was a well-preserved skull. The mound is 25 or 30 feet in diameter and 4 feet in height.

I.—A small mound, 3 or 4 feet high and 15 feet in diameter, stands upon a very high hill, perhaps the highest land in the county, and is composed of stone and clay. It was excavated some years ago by Dr. Emerick and a Mr. Long, who are said to have found a skeleton in a kneeling or sitting posture, and a pipe, both near the center. The author was unable to learn what had become of the pipe. Messrs. H. B. Care and J. Freshwater made another examination in 1876, but found nothing. There is a large spring at the foot of the hill, on the east side, but it is nearly half a mile from the spring to the mound on the hill.

J.—This work is said to be located on the west side of the creek. The author has not visited the site.

K.—In 1876 the author, in company with Mr. J. Freshwater, made a slight examination of this mound. It is 25 or 30 feet high, oval in shape, and over 100 feet long. The citizens regarded it as an artificial mound, but we considered it a natural elevation of gravel drift. Excavations might change this view. The mound is located on the west side of the Lake Fork, and just north of the road and bridge leading from Mohican to McZena in Lake Township.

L.—A mound is situated on the lands of J. L. and Cyrus Quick, in Washington Township, Holmes County, Ohio. It stands upon an eminence which slopes gradually for half a mile southward toward the bottom lands of the Lake Fork; northward and westward it declines a short distince to a small valley extending to the southwest. It is about 5 or 6 feet high, and 30 feet in diameter. Some trees were growing upon the mound when the author first visited it, some twenty-seven years ago. The trees were, perhaps, not of more than one hundred years' growth, but were as old as the trees in the immediate vicinity; not far from it, however, were oak trees 2 and 3 feet in diameter. The mound was excavated about 1820–'25 by Isaac and Thomas Quick, Daniel Priest, and others. It is said that, upon making a central excavation, they found a wooden puncheon cist, together with some human remains, and ornaments of muscle shell, which appeared to be strung around the neck. All the remains are reported to have crumbled away on being exposed to the air. It is difficult to ascertain the facts concerning this excavation. It has been said that some pottery was found also. Additional remains might be disclosed by further investigation. The persons who made the excavation are dead.

M.—This mound, located a little southwest of mound L, on the lower ground about half a mile from the same, was probably of an equal size originally, but, having been plowed for nearly fifty years, it is now spread over quite a space. It is, however, still discernible from a distance, and shows the elevation from the flat surface of the field. The yellow clay presents a contrast with the darker soil of the surrounding land. No excavation had been made until 1877, when the author, aided by Mr. Freshwater, removed about 4 square feet from the center. We found tough, tempered clay, some bits of charcoal, but no remains. This could not be regarded as an examination, being of so small a character. Further work on this mound might unearth interesting relics.

N.—A lake is situated a short distance east of mound M, on the farm of D. Kick, Washington Township, Holmes County, Ohio. In draining this pond a *cache* of flint implements was discovered. Specimens of these implements may be seen in the Smithsonian collection: The remainder are in the author's possession. (See Smithsonian Report of 1877, article by H. B. Case.)

O, P.—There are mounds southeast of Odels' Lake, upon the summit overlooking the lake, on the farm of J. Cannon. They were excavated by Dr. Boden, of Big Prairie, Ohio, who has in his possession some teeth, jaw bones, and long bones taken from them. He says that they should be further examined. The author has not visited the mounds.

Q.—A mound stands on the summit of Dow's Hill, one mile northeast of Loudonville, just east of the Holmes County line. It was excavated about 1855 by Dr. Myers, of Fort Wayne, and D. Rust, who found a skeleton near the center, whose structure is of stone and earth. The top has since been leveled by the plow. In 1876, Mr. Lucien Rust made some excavations upon the site of the mound, and great numbers of stone were removed. At length a kind of pot or cist was unearthed, which was about 18 inches in diameter and 8 or 9 inches deep. It was formed of stone, and the edge was covered by other stones which made a roof over the pot. The removal of this roof or top showed that the cist was filled with charcoal, apparently closed while glowing coals. About 4 feet below this charcoal deposit human remains were found, reposing horizontally. Near the left hand was a perforated stone having the figure of a bird, resembling slightly the pheasant, scratched upon it. A part of a bone implement was also found. The bone, which is of firmer texture than the human bones, and is perhaps a part of the leg-bone of a deer, had been perforated, evidently with a stone drill. Lying across this lower skeleton and some distance above it were the remains of another. But little of the mound has been excavated, and further examination should be made. From the mound the view of the surrounding country is very fine. The mound proper has been obliterated for some years, but the site can be observed by a slight elevation and the great number of stones scattered about and upon it. There must have been a kind of hollow made in the Waverly shale which lies near the surface upon the underlying Waverly sandstone, of which the hill is composed, because when one digs the same depth elsewhere on the hill the shaly sandstone is penetrated. The stone implement is in the possession of L. Rust, Loudonville; the bones, bone implement, and charcoal are in the author's cabinet.

R.—This mound, similar to mound Q, is situated just north of Loudonville, on the summit of Bald Knob. For a long time it was supposed by the citizens of Loudonville to have been formed by counterfeiters in former times. The author excavated it in 1877, and found it a veritable mound containing fragments of human bones and of charcoal. Being encased with large sandstones, and composed of stone and earth, it is very difficult to excavate. As there has been a central depression for a great many years, what remains the mound V contained of a perishable character have probably been destroyed by the collecting of water. This site also commands a fine view ot the Black Fork Valley.

S.—The settlers of 1808–'09–'10 found here a village of Delawares, the remnant of a "Turtle" tribe. Their chief was a white man, taken in infancy—Capt. Silas Armstrong. They removed to Piqua, Miami County, Ohio, in 1812, the site of the old burying-ground, now almost entirely obliterated by cultivation. It is located a few rods north of the Black Fork, upon a gentle eminence, in the southwest part of northeast quarter-section 18, Green Township. The southern portion of the site is still in woods, and the depressions that mark the graves are quite distinct. Henry Harkell and the author exhumed several of the skeletons in the summer of 1876. In some cases the remains were inclosed in a stone cist; in others small, rounded drift-bowlders were placed in order around the skeletons. The long bones were mostly well preserved. No perfect skull was obtained, nor were there any stone implements found in the graves. At the foot of one a clam shell was found. The graves are from 2½ to 3 feet deep, and the remains repose horizontally. A few relics, such as stone axes, arrow-heads, and a few bits of copper, have been picked up in the immediate vicinity. They are in the hands of the author. On the opposite side of the stream and some distance below, near the south line of southeast quarter section 18, Green Township, there are ancient fireplaces. They are about 15 inches below the present surface, and are formed of bowlders regularly laid. The earth is burned red. Great numbers of stones have fallen into the streams during its incursions upon the west bank. Some three or four of these fireplaces are yet plainly visible, but in a few years they will be swept away by the current. About half a mile east of the graves marked S is a small circular earthwork almost razed. It contained about 1½ acres, and had a gateway looking to the river, which is westward. It is situated upon the nearly level bottom land of the beautiful valley.

T.—Upon the high ridge separating the valleys of Black Fork and Honey Creek is a depression filled with large and small bowlders. J. Freshwater and the author removed them to some depth, but as the stones were heavy we desisted from further investigation. This point would command a view of the valley of the Black Fork, overlooking, as it does, the old village of Greentown; and by walking a few rods eastward on the same eminence a view of the valley of Honey Creek might be had. Most of the trees on this height are less than 100 years old. It may have been timberless during the occupation of this work. The excavation appears to have been about 15 feet in diameter.

U.—There is a stone mound, like mound R, situated on a lofty eminence overlooking the Black Fork Valley northwestward, and eastward the valley near Loudonville. The author has never seen the work, but it has been described to him as a small stone and earth mound such as are usually found on high points.

V.—A short distance northwest of mound W, on the farm of L. Oswald, southwest quarter section 18, in the woods, is a mound about 30 feet in diameter and from 4 to 6 feet high. It was slightly opened at the center by the owner of the lands, who found part of a skull.

W.—This mound and earthwork are located upon the old Parr farm, now owned by C. Byers, in the northwest part of southwest quarter section 19, Green Township. The mound stands on the west side of the Black Fork, within 2 or 3 rods of the stream. It was quite large originally, perhaps 8 or 10 feet high and 35 to 50 feet in diameter. At present it is from 4 to 6 feet above the level of the bottom land and is spread over a considerable space. When the first settlers came, there was an earthwork running a little southwest from the mound for some 20 rods, then back eastward to the river. The place has been under cultivation for forty or fifty years and the work is now obliterated. The mound was encased with a wall of sandstone bowlders as large as a man can lift.

These stones must have been carried from the hill half a mile west, where they are found in place. The wall was carefully laid, as can be seen by excavations below the depth of the plow where the pile is still intact. The mound was examined in 1816 by some persons named Slater, who found in it bones, flint implements, a pipe, and a copper wedge which they thought gold. Accordingly they took it to a silversmith at Wooster, Ohio, who told them that it was copper, and bought it from them for a trifle. In 1878 the mound was explored by J. Freshwater and the author. The center of the mound, where not disturbed by former excavations, resembles an altar or fire-place where the fire had burned the earth to a brick-red. In the ashes and burnt earth were fragments of arrow-heads broken by the heat. The fire had been kindled on the mound when it was from 2½ to 3 feet high. No human remains were discovered in this last excavation. A few scrapers were found, which are in the cabinets of the above-named gentlemen.

X.—On the summit of a hill west of Perryville, and to the right of the road leading to Newville, was a mound, now entirely obliterated. In 1816–'20 it was opened by the Slaters, who found a pipe, human remains, and some other relics.

Y.—A large oval earthwork on the summit of the ridge between the valleys of Black Fork and Clear Fork. It is 210 feet wide by 350 feet long. About the center of the inclosure was a large pile of stone bowlders, most of which have been removed to the level of the ground. There is, however, a visible outline of the stone-work, which consisted of a paved circular space. No excavation has been made in either the stone or clay work beyond 1 or 2 feet in depth; consequently the character of the mound is unknown. A forest, containing oak trees over 30 inches in diameter and other large trees, covers most of the work, but a portion extends into a field and has been almost razed by the plow.

Z.—On a high hill directly north of the junction of the Black Fork and the Clear Fork, and overlooking the same, is a stone and earth mound composed principally of large sandstones from the immediate vicinity. Some twenty or twenty-five years ago it was explored by unknown persons. The author examined it again in 1877, but discovered nothing. A similar mound is said to have been located upon the hill south of the Clear Fork, just below the junction of Pine Run. The stone were hauled away and the site plowed over. (See *Z a.*)

Z b.—This is the site of Old Delaware village of Hell Town. It was deserted about 1782, the time of the massacre of Anaden Hutten. Graves were visible until two years ago; the field is now cleared and plowed. In the author's cabinet are two iron scalping-knives and an iron tomahawk which were thrown up by the plow; also the brass mountings of a gun, a gun-flint, a stone ax, and some arrow-heads. Dr. James Henderson, of Newville, Ohio, has in his possession several articles obtained from this site. The Indians formerly called their settlement Clear Town, and the stream Clear Fork; but learning the German word *hell*, for clear or bright, they changed the name to Hell Town.

Z c.—A rock shelter is located on the west side of Clear Fork, in the conglomerate sandstone of the Lower Carboniferous. It was explored in 1877 by L. Rust and the author, who found about 2 feet of ashes intermingled with a few animal bones and coprolites. No human remains were disclosed excepting a split bone, and even that is doubtful. The ashes continue deeper, and further examination might prove interesting.

EARTH-WORKS NEAR JONES' STATION, IN BUTLER COUNTY, OHIO.

BY J. P. MACLEAN, *of Hamilton, Ohio.*

While I was engaged in examining the earth-works of Butler County, Ohio, I was informed by Mr. John W. Erwin that an ancient work was near Jones' Station. On repairing thither I was unable to find either the work or any one who had ever heard of it. I next attempted to find the papers of Mr. James McBride, but no one knew what had become of them. The record of the sale of McBride's effects gave no account of them.

During the month of December, 1879, I received a note from Mr. W. S. Vaux, of Philadelphia, stating that he owned both the cabinet and the archæological papers of the late James McBride. I immediately applied for that portion of the papers relating to the earth-works near

Jones' Station. These papers were placed in my possession January 26, 1880. On the 27th of the month, in company with Mr. John W. Erwin, I started to locate the works. Although it had been nearly thirty-eight years since Mr. Erwin visited the spot and assisted in the survey, and made the original delineation, he recognized the spot and the plan of the works as preserved in the papers of James McBride.

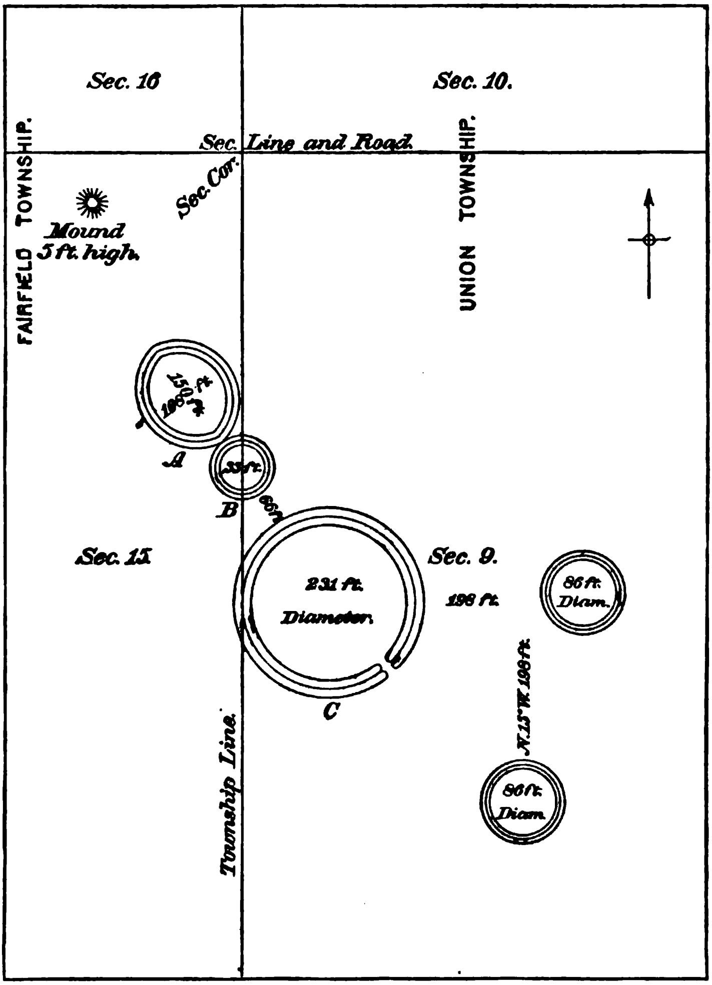
These works were located on the southeastern slope of one of the highest hills in the vicinity. The hill is a detached one and surrounded entirely by one of the richest valleys in the State. Between it and the uplands toward the north was originally a swamp. This swamp was drained at the expense of and under the direction of the State. Through it passes the Miami Canal. The hill is composed of a yellowish clay, having been formed during that period known as the glacial or drift. Its summit is about 225 feet higher than the city of Hamilton.

The works are now entirely obliterated. There is not the slightest evidence that they ever existed. We searched in vain. They occurred in both Fairfield and Union Townships, on section 15 of the former and 9 of the latter. The township line passing through the works, if extended southward, would terminate at the foot of Broadway, in Cincinnati. The work marked A is wholly in Fairfield Township, while the township line passes through the center of the smallest circle, marked B. The same line passes on a fraction of the wall of the largest circle, C. On the summit of the hill, Fairfield Township, section 15, is a mound composed of yellow clay, about 5 feet high, from the top of which a commanding view of the surrounding country may be obtained. It probably belongs to that class of mounds known as signal stations. It would be impossible to tell the original height of this tumulus. The plow for fifty-two successive years has accomplished all this destruction.

James McBride came to this county in the year 1808; and, as he early took an interest in antiquities, it is probable he saw these works before the forest trees had been cut away. He and John W. Erwin surveyed the works May 7, 1842. The following is a verbatim copy of Mr. McBride's description:

"*Saturday May* 7, 1842.—Went, in company with John W. Erwin, civil engineer, and James McBride, jr., to an ancient work in Butler County, Ohio, six miles southeast from the town of Hamilton, on the lands of James Beaty. The work is situated principally on section No. 9, town 3, range 2, M. R., about 30 poles south of the N. W. corner of the section. On measuring the main part of the work it was found to be a true circle 3 ch. 5 links in diameter. The ground was cleared some 14 or 15 years ago, and has been cultivated since that time, consequently the height of the embankment has been much reduced. Previous to cultivation the embankment was fully three feet high above the natural surface of the ground. Inside of the embankment was a ditch two feet deep, making a perpendicular height of about 5 feet from the bottom of the ditch to the top of the bank.

"Three chains east of this work is another circular work 1 ch. 30 links in diameter, and from this in a direction S. 15° W. three chains distant is another circular work of the same dimensions, viz, 1 ch. 30 links diameter, and also the same distance, viz, 3 ch. 00 links from the center or main work.



"At the distance of one chain N. W. from the center or main work is another small circular work two poles in diameter, and adjoining and touching this is still another enclosure, of an oval form, from 2 ch. 30 links by 1 ch. 70 links in diameter, extending in a N. W. direction.

"The embankment of the smaller works before reduced by cultivation was upwards of two feet high above the natural surface, with ditches on the inside eighteen inches deep.

"On the S. E. of the main work is an opening in the embankment communicating with the smaller works to the S. E. Probably communications might have existed throughout from one work to the other, though they cannot now be distinctly traced.

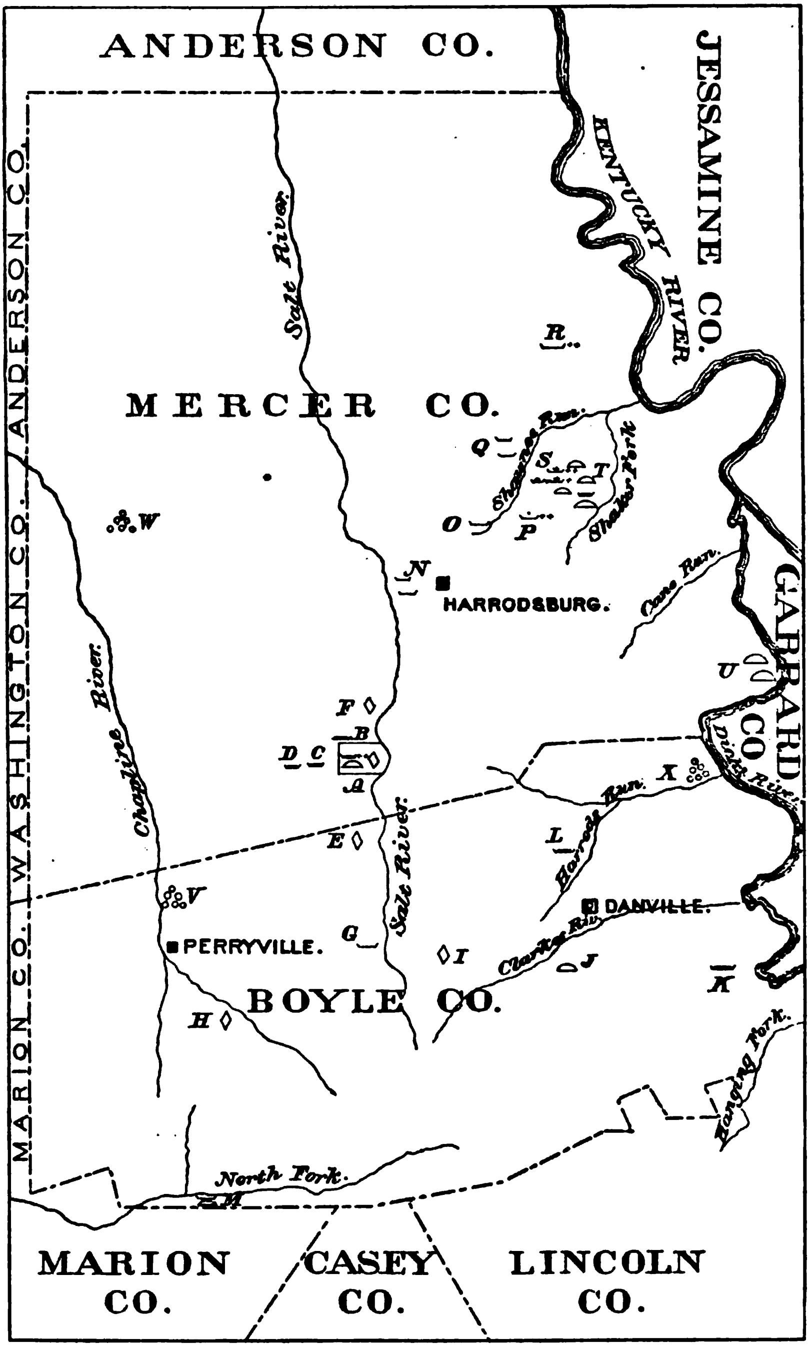
"The embankments of these works are of a bright yellow clay, differerent from that which appears on the surface of the surrounding ground, hence the form of the works can be distinctly seen and traced as far as the eye can see them."

MOUNDS IN BOYLE AND MERCER COUNTIES, KENTUCKY.

By W. M. Linney, *of Harrodsburg, Ky.*

In the counties of Boyle and Mercer, State of Kentucky, there are a number of mounds, graves, &c., which were constructed by former inhabitants of the country, and many aboriginal implements have been found. On the map of Boyle and Mercer Counties I have located all points of interest that I have been able to learn. They will be alluded to more particularly in the following notes by the letters that are connected with them. The point of greatest interest (A on the map) is situated on the west bank of Salt River, in Mercer County, a little north of its union with Boyle County, on a farm owned by Dr. Thomas Hyle. The first notice given of this point is found in "Collins' History of Kentucky," under the head of Mercer County. Speaking of ancient towns and fortifications, it says: "There are two of these, both on Salt River, about 4 miles above Harrodsburg, containing ditches and a mound 10 or 12 feet high, filled with human bones and broken pieces of crockery-ware. On one side of the mound a hickory tree, about 2 feet in diameter, grew and was blown up by the roots, making a hole 3 or 4 feet deep. Its lower root drew up a large piece of crockery-ware which had been on some fire coals. The handle was attached to it, and human hair lay on the coals. This was probably a place of human sacrifice. The other ruins were about a mile and a half above this, both being on the west bank of Salt River. There is no mound near this, but only the remains dug out of ditches."

The ground has been cleared, and the continual cultivation of the land has filled up the ditches and removed all traces of any lines that once existed. The mound has also been removed by the plow. From it have been taken, as cultivation yearly went on, the bones of a number of human skeletons, none of which were retained, few of them being in a good state of preservation; the skulls crushed to fragments and the soft ends of the bones, with few exceptions, gone entirely. I do not know that any relics have been taken from the mound proper, except some shell beads. The river bank here is only about 15 feet high, and the slope back from the river is not more than 2°. The mound stood 200 yards from the stream. Between those points there must have been a village of huts or some form of habitation; for even now, when the ground is freshly plowed, there is a regular parallelogram, where the uniform lines of black earth, charcoal, and burnt bones show the former presence of fires long continued at that point. Within this area have



been found a great number of specimens of broken crockery, plain and ornamented in crossed lines; grooved axes of greenstone; celts in greenstone, jasper, agate, hornstone, and limestone; pipes, arrow and lance heads, chisels, grinding stones, pestles, sinkers, flint flakes and cores, ornaments in slates and other colored stones; bones of fish and many animals, horns of deer and elk, teeth of bears, &c. Some of these may have been thrown up by the plow and scattered over the space near the mound. From the number of fragments of various stones, it seems that there was a workshop here, and so I have located one on the map. The mound was built of earth taken from the vicinity, and there were evidently some large stones in connection with it, but how they were placed is not known. B, C, D were within a mile of A, and were single graves. They have all been opened, and each contained one skeleton, without implements or ornaments so far as known. In one, the body seemed to have been buried horizontally, on the right side, with the head to the east; the position of the others is unknown. There seemed to have been a stone cist erected on or near the surface of the ground; and then rocks appear to have been set on edge around it, until a space 10 or 12 feet square was inclosed. If ever covered with earth, time has removed it down to the rocks. B is on the farm of Dr. Thomas Hyle, and C and D on that of Cornelius Terhune. E and F are points on Salt River, above and below A, where remains of pottery, &c., have been found; but their real character cannot be determined. E is on the farm of John Ludwich, in Boyle County, and F on that of Mrs. Lewis.

G is a grave on the farm of Thomas Knox, but I have not seen it. From description it is like B, C, and D.

H is only a point marked by great numbers of flint chippings and broken arrow-heads.

I represents a space on a farm owned by W. B. Cecil, where a great many pipes, axes, &c., have been found.

J is a mound of earth on the farm of the Misses Craig, about 1½ miles south of Danville, in Boyle County. It is some 5 feet high and 50 feet in circumference. It has been opened, but I know of nothing obtained from it.

K is located on the farm of John F. Yedger. It has been opened, and is similar to B, C, D.

L is in Boyle County, on the land of Wyatt Hughes. It was destroyed by excavating a road-bed for a railroad; and seems to have been like B, C, and D.

M is a small earthen mound on the southern bank of Rolling Fork, Boyle County. It has been razed by cultivation. Some bones, a grooved ax, and a few arrow-heads of hornstone were disclosed.

N is said to be the site of two graves, and is just west of Harrodsburg and "old Williams" place. From what I can learn the graves are like B, C, D.

O is a single (?) grave with stones set up around it. I have not examined it, but from appearances it is like B, C, D.

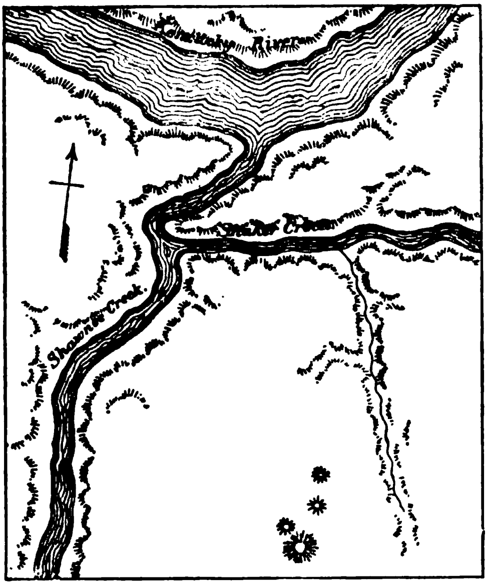
P is an earthen mound, on the farm of J. A. Shuttleworth. It is 4 feet high and 50 feet in circumference, and was opened in 1807 or 1811 and later. From an old man, who was a boy when it was first opened, I learn that a number of bodies had been buried in it, and that an ax or two were found. On the night of the day on which it was opened occurred the earthquake of that year, and the whole neighborhood thought that the Indians had come after them for disturbing their bones.

Q was one or two graves, now obliterated, on the farm of Achilles Davis.

R is a point on the farm of Dr. Walter Davis, where some relics were found in digging the foundation of a house. A lot of bones were near these relics.

S is the site of three graves covered with stones placed on edge, and is on the farm of George Davis, sr. The two near each other have been opened, and a number of human remains were exhumed from each. They had, seemingly, been buried with their heads together and their feet radiating from this center. Plates of mica were found with the crushed skulls, as if they had been placed over their eyes. Only one implement was obtained here. A bone had apparently been buried with one of the bodies, and, when discovered, it was lying upon the arm, at the elbow, and parallel to it. The third grave has not yet been examined, but will probably be explored in the spring.

T is a group of four earthen mounds on the farm of Thomas Coleman. They have all been excavated at some time. The last examination took place in July past, and yielded one skeleton, and a copper bead almost destroyed by oxidization. Their relative positions as to streams and to each other is shown in diagram T. (See also the accompanying plan.)



U is the site of two mounds 8 feet high, and 60 or 70 feet in circumference, on land owned by Mr. Hugely, upon the bluffs of Dick's River. The mounds seem to be composed of gravel, earth, and limestone. Several persons have examined them, and pronounced them mounds. Partial excavations have been made, but without success. Poplar trees (*Liriodendron*) 2 feet in diameter are growing upon them. I am disposed to think that the mounds are the remains of lime-kilns made in the first settlement of the State; at any rate the limestone in them has been burned.

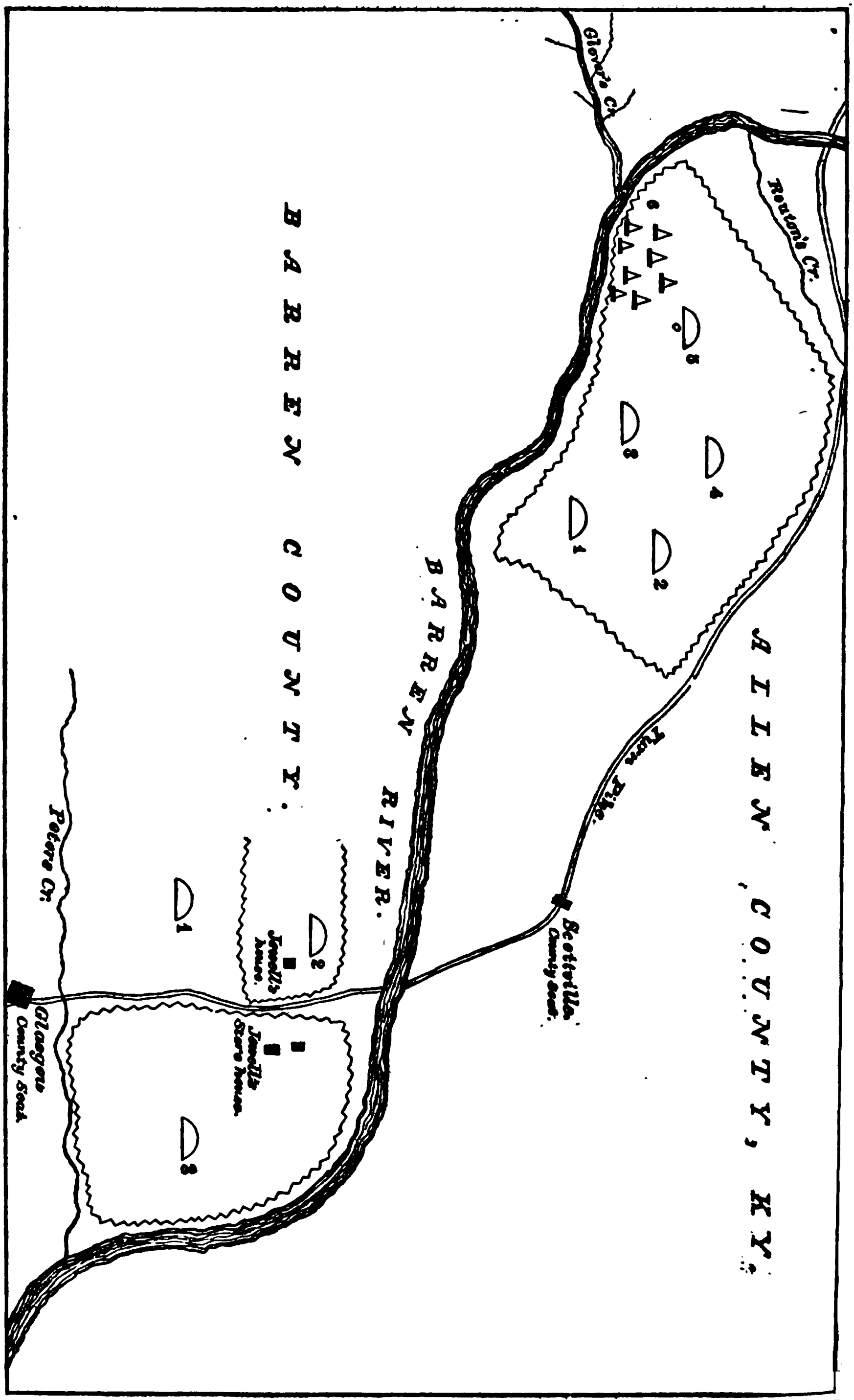
V was a large pile of rocks, giving no evidence of ever having been covered with earth. It was opened and some skeletons were found, probably those of Indians killed in some attack on Harrodsburg.

W and X are similar to V.

The above list includes all the points of much interest in these two counties. Nearly every spot mentioned has been examined, and the relics carried off or destroyed. The great majority of those relics, such as pipes, arrow and lance heads, grooved axes, and celts, have been plowed up isolated in fields all over the counties; but the larger number have been found on the farms contiguous to Salt River. No shell heaps have been noticed except at A, where the common mussel of Salt River seems to have been used for some purpose other than pottery manufacture, perhaps as food.

Nothing is known as to our caves or cliff shelters having been used for dwellings. A cave east of Danville, on the farm of Samuel Stone, contained some human skeletons; but as the remains had been thrown down into a sink-hole without other opening, and as there were no implements, I suppose that the persons were Indians, or perhaps murdered whites of a comparatively recent date, and not mound-builders. The bones were in a good state of preservation. Nowhere in this part of the State has anything resembling masonry been observed, to my knowledge.

As far as I can learn, no carving, engraving, or sculpture has been discovered in those counties; but in the Deaf and Dumb Institution at Danville, Professor Dudley, principal, there is a carved image or rather bust of Aztec type, which was plowed up in Marion County, Kentucky. Rock paintings and inscriptions are not found here. The dead are discovered both in mounds and in isolated graves. Some contain one individual, others more. It is difficult to determine the position of the bodies when interred, as the pressure from above and the trees over them have forced them out of place. Some appear to have been buried in a sitting posture, some were stretched out, and others evidently lying on their sides. They were laid, in most cases, toward the east, sometimes toward the west, and again in every direction like spokes in a wheel. A few were placed in cists, others in earth only. Generally only a few of the more solid bones were preserved. At one point in Boyle County some arrow-heads were turned up by the plow, but they were lost or thrown away. No large places are known where flint implements have been manufactured; but chippings, evidently broken off by mechanical means, show that arrow-heads have been made in limited quantities. I am unable to learn whether or not the pottery found at A had been made on the grounds. The presence of many fragments, the quantities of decaying mussel shells, the balls of sand carried from the river, and the proximity to suitable clay all render it likely; yet there are no places, that I could see, which give any reliable evidence of its manufacture.


Glover's Cr.
Routon's Cr.
6
5
4
3
2
1
BARREN COUNTY.
BARREN RIVER.
ALLEN COUNTY, KY.
Turn Pike.
Scottsville County Seat.
Peters Cr.
1
2
3
Jewell's house.
Jewell's Store house.
Glasgow County Seat.

PLAN 1.

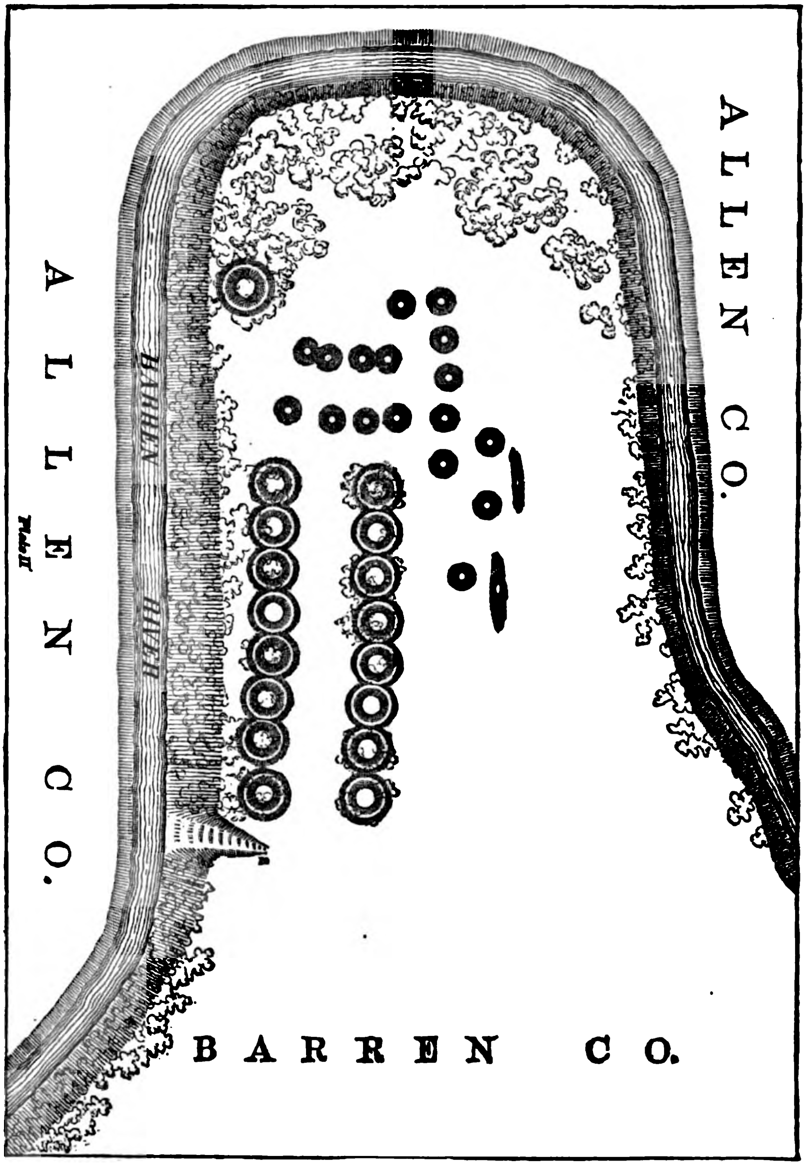
MOUNDS IN BARREN AND ALLEN COUNTIES, KENTUCKY.

By R. B. Evans.

I. *Mounds in Allen County.*—The figures in the text refer to the accompanying map. Nos. 1, 2, 3, 4, and 5 are mounds on Barren River, and near the mouth of Routon's Creek. They are inclosed in one corner of a cultivated field, though covered thickly with large trees. No. 5 was explored about fifty years ago, and some stone implements and a silver pipe were found. The author does not know what became of them. About two years ago he thoroughly examined No. 1, and discovered many large bones, which, however, were much decayed. The vault was 10 feet deep from the top of the mound, and 8 feet in diameter. It was round, and walled up with stones like a well. Every 2 feet was a layer of large flat rocks, and between these layers were human remains. The bottom was made of stones laid edgewise, and, being keyed in with small stones, was consequently very tight. Old farmers in the neighborhood say that Nos. 1, 2, 3, and 4 have never been excavated. No. 6 is a cluster of graves which were formed of stones placed edgewise. Some of the graves are long and others short, the longest being 8 feet and the shortest 2½ feet in extent. The author opened one and found some human bones in a very decayed state.

II. *Mounds in Barren County.*—Nos. 1, 2, and 3 are mounds on Barren River, at the mouth of Peter's Creek. From No. 3, the largest, a great many human bones and several stone implements have been taken. The author has one specimen of the latter. Nos. 1 and 2 are not so large, and have never been explored. They have been seen by Professor Putnam, of Cambridge. The mounds are bare of timber. No. 3 is now used as a graveyard by J. F. Jewell, the owner of the land.

III. *Ancient town and cemetery in Barren County, Kentucky.*—The accompanying diagram, Plan II, represents the location and details of an aboriginal town and burying-ground on the Barren River, in Barren County, Kentucky. The work occupies a bluff 60 feet high. The sixteen circular figures are lodge sites, partly raised on the outer rim and depressed in the center. In the center of each, a foot beneath the surface, were found coals, the grain of the wood being easily distinguished as oak and poplar. The diameters of these rings average about 18 feet. The other figures represent mounds. These works are now in the virgin forest. One of the mounds was opened by the author, but a detailed account of the exploration will have to be deferred.



PLAN 2.

MOUNDS ON FLYNN'S CREEK, JACKSON COUNTY, TENNESSEE.

By Joshua Haite, Sr., *of Jackson County, Tenn.*

The valley in which these mounds are situated is on the east bank of Flynn's Creek, which empties into the Cumberland River, and is 3 miles above the mouth of the creek and 1 mile south of the river. The valley is 4 miles west of Gainesboro', the county seat, and near the center of a section of country that abounds in mounds and graves. This valley which is full of these graves, contains near 100 acres, and is the site of the village called Flynn's Lick. There are five limestone springs, one sulphur spring, and a salt spring. From the number of mounds of earth, stone, and shell, it is evident that it has been a large town and a place of note among the inhabitants of that day. A further reason is that the valley is easily approached from every direction. The valley is full of graves, placed as close as they can be in the ground. It has been in cultivation sixty-five years. Before it was cleared it was covered with a dense forest of trees, some of which are from 4 to 6 feet in diameter. Even on the tops of these mounds trees were standing (of the oak and poplar species) measuring 4 and 5 feet in diameter. At the time the valley was cleared it was not known that there were any graves there.

The graves are of all sizes, varying from 18 inches to 6 feet in length and the usual size in width. The coffins are made of slate-rock slabs (which now seems to be plentiful 4 miles up the creek, where there is a large quarry), and are generally neatly polished. The bones and pottery are now found from 18 to 20 inches below the surface of the ground. The coffins are constructed in the following manner: They first placed on the bottom of the grave one or two slabs of slate-work neatly polished and jointed closely together in the middle when they had to use two of them; they next placed one at the head and one at the foot of the grave; then they set up one or two, as the case required, on edge on both sides, neatly fitted together in the middle and at the ends, which forms a box. They next took one or two pieces, as the size of the coffin demanded, neatly polished and jointed together in the middle and at the ends, and placed them on for the lid, projecting on all sides from 2 to 4 inches. Occasionally we find a grave where they have used limestone instead of slate rock.

On the east side of the creek, about 100 yards from its bank, is the grand earthen mound, which is larger and higher than any of the others in the valley. All the graves as a general rule face this grand mound; but occasionally, owing to the rock in the ground, this rule is varied and the direction changed, showing that closeness or compactness was their leading idea.

The mounds referred to in this valley and vicinity are composed both of earth and stone, and are found on both sides of the creek. The largest earthen mound, which I call the grand mound because all the graves are facing it, is about ninety feet in diameter, and at this time about 4 feet high; but when first discovered by whites it was 5 or 6 feet high. This mound has not yet been examined, but others in the valley, not so high but larger in diameter, have been looked into and were found to contain graves, pottery-ware, pipes and arrow-heads made of dirt or cut out of rock. These are found in the graves in the mound and in those around it.

On a hill adjacent to the valley, about 200 feet high, are six stone mounds constructed of rough limestone rock. These mounds are situated about 300 yards east of the valley. They are about 20 feet in diameter and 2½ or 3 feet high. Four of them have been examined, and all of them were found to be full of human bones and pottery ware, but not so close together as the others. The graves were constructed, or covered over with rock, differently from the others. The corpse seems to have been put in first, and then rock slabs set up and placed together at the top in the shape of the roof of a house. In this way was the place filled with graves all over a certain spot, and then rough stone piled on until the mound was formed. I have spoken of only six mounds on this hill, of this kind; but there are many in this vicinity of this kind, but they have not been examined. Near the center of the mound examined by me, in a grave, were found bones of a human being charred perfectly black, around which were placed all the others.

On the west side of the creek is a bluff in which were found several holes, and on examination one of them was found to lead into a cave which has been explored for about 100 yards. This cave contains several apartments which are dry, and within this are found a great many human bones, some of which are still in a state of preservation.

A female skeleton was taken from a grave found about 80 yards west of the mound that I have designated in this letter as the grand mound. This skeleton was lying with the face towards the mound, with a pipe in her right hand resting on her right thigh. With this skeleton I found in opening the grave an infant child lying with its feet against the thigh bones of its mother. When first opened this child's skull-bone and other bones were in perfect form, but as soon as the air came in contact with it it broke into lime, or powder. This female evidently died in childbirth, the feet of the fœtus coming first. This female we are led to believe, from the pains taken in burying her, must have been of note amongst them, for I found in disinterring this skeleton that the remains were deposited in a wooden coffin, and then this one was put into one of neatly polished rock. A jug was found, with the mouth down and the bottom upwards, placed against the skull-bone. The stone with a hole in the center, which is called a corn-muller, I found about 80 yards from the grand mound. This was plowed up and found, among a large number of human bones in a decayed condition, upon the top of a small mound in the valley. The pottery, of the character sent, is found in all the graves and in a similar condition.

ANTIQUITIES AND ABORIGINES OF TEXAS.

By A. R. Roessler, *of Washington, D. C.*

In my frequent walks, some years since, along the beaches of the bays and inlets of the Gulf of Mexico, a few miles south of the Guadalupe River, I rarely failed to find a number of aboriginal relics—especially immediately after the ebb of a high tide. I have also found many about the bases of the sandy hillocks, or "dunes," which have been heaped up by the winds in many places along the coast. I have occasionally found large flints; but these were probably used for harpoons. Some of these arrow-heads are very rudely wrought, while others, particularly a very small kind, are of exquisite finish, with a point as sharp as a lancet, and the cutting edges finely and beautifully serrated. Most of the specimens collected by me had necks, or shanks, by which they were fitted into the shaft; a few, however, were without this appendage, but were either grooved or beveled on both sides of the base of the tongue. The flint pebbles, from which these arrow-heads were chipped, were probably obtained from 30 to 40 miles inland, where they abound in several localities. All the Indian tribes of Texas, when it was first colonized by Americans, used metallic arrow-heads, which they had probably substituted for flint ones nearly a century before, or not long after the establishment of the missions and military posts of San Antonio and La Bahia, where they doubtless obtained copper, brass, and iron, all of which metals they used for pointing their missiles. Fragments of earthen pottery are coextensive with the flint relics. But they bear evidence that our aborigines were never much skilled in the ceramic art.

The Indian dead usually receive very shallow sepulture. Often the Texas tribes do not bury their dead at all, but merely pile logs or stones upon their bodies, which are soon extricated and the flesh devoured by beasts of prey. The bones being thus left to the action of the elements, rapidly decay. Hence the osseous remains of the aborigines are rarely found far inland, but in various places along the coast the winds have performed the rites of sepulture by blowing the sand upon the dead. At Igleside, in 1861, human bones were disinterred at two localities more than a hundred yards apart, from a depth of 8 feet; and recently, in October, 1877, others were discovered in a sand hill, or "dune," near what is locally known as the "False Live Oak," in Refugio County. About a month after the discovery I went to the spot and found that a large quantity of human bones, including several skulls, had been exposed by the caving of the "dune;" but being much decayed, had broken to pieces in falling, and quickly dissolved in the Gulf tide at the base of the "dune." I saw for 40 feet along the face of the steep slope, from which the sand had slidden, a number of human bones and skulls projecting at various angles. One skull, which was better preserved than the rest, was of medium size and remarkably round. The others seemed of similar size and type. The teeth of all were well preserved, and did not exhibit any appearance of having been faulty during the lifetime of their owners. None of the bones seemed to have belonged to persons above the average size, with the exception of one femur. Neither the vertebral nor pelvic bones, the ribs, the omoplates, nor the bones of the hands and feet were preserved. These human remains were from 5 to 7½ feet beneath the surface of the ground, and 10 or 12 feet above the level of the bay.

After an interval of about six weeks, I again visited the spot. About 2 feet of the hill had caved away since my first visit; but the bone deposit was still unexhausted, for I found three more skulls and several limb bones, all of which broke into fragments in extracting them from the compact sand.

I was disappointed in not finding stone arrow-heads in the caved sand. But my search for them was not thorough. There is no reason, however, to doubt that these are aboriginal remains. Their imperfect state of preservation in any kind of earth, very conservative of organic substances, alone warrants the conclusion that they are ancient, which is reinforced by an argument which I will here state. These remains are found at the southern extremity of a sand ridge about 2 miles long from north to south, and varying in height from 20 to 40 or 50 feet, and which was evidently formed while the gulf beat directly upon the shore of the mainland. But ever since the long, sandy islands extending parallel with our coast were heaped up by the action of the waves and currents of the sea, the only communication between the gulf and the interior bays, or lagoons, has been through a few narrow channels called "bayous." The consequence is, that the sandy materials of which the "dunes" are formed, instead of reaching the shore of the mainland as in former ages, are now deposited on the gulf side of the islands and blown up by the east and southeast winds into hillocks similar to, but generally less elevated than, those which were formerly heaped by the same agency upon the mainland.

Now, on the assumption that these human remains, in accordance with the universal custom of North American savages, were only interred to the depth of 2 feet at most, several feet of sand must subsequently have been blown over them to account for the depth at which they were found, and the sand for this purpose must have been transported to the adjacent beach by the currents of the gulf. Hence, I conclude that the remains were deposited in the "dune" before the gulf was cut off from the mainland by the formation of the chain of island barriers above mentioned. The sand ridge containing the osseous relics has been preserved from the wasting effects of the winds by the thickets of dwarf oak and sweet bay with which it is overgrown. Some of the live oaks at its eastern base are of sufficient girth to indicate an age of two centuries. Other oaks of the same species a short distance south of the "dunes," and very near the bay, are of much greater antiquity. All these trees must have grown up since the Gulf retreated behind Matagorda Island, which at this point is about 8 miles distant from the mainland. From all of which it follows as highly probable that the human remains, which I have described, were inhumed at a period when the broad waves of the sea resounded along the shore of the mainland, and before the sail of a ship had gleamed on the Gulf of Mexico.

Both history and tradition preserve the names of several tribes of Texas Indians, which had become extinct or had been blended with other tribes before the State was first colonized by Anglo-Americans, at which period, A. D. 1821, the only tribes with which the settlers came in contact were the Comanches, Wacos, Tawacanies, Ionies, Keechies, Lipans, Tonkaways, and Carancaways. Of all these tribes the last named was the most remarkable. They inhabited the coast, and ranged from Galveston Island to the Rio Grande. The men were of tall stature, generally 6 feet high, and the bow of every warrior was as long as his body. These Indians navigated the bays and inlets in canoes, and subsisted, to a considerable extent, on fish. They were believed by many of the early settlers to be cannibals; but it is probable that the only cannibalism to which they were addicted was that which was occasionally practised by the Tonkaways, if not by all the tribes of Texas. This consisted in eating bits of an enemy's flesh at their war dances to inspire them with courage. A dance and feast of this kind I once witnessed at a settlement on the Colorado, where the Tonkaways were temporarily camped. A party of its braves on a war tramp slew a Comanche, and upon their return to their tribe brought with them a portion of the dried flesh of their slain foeman. This human "tasajo," after being boiled, was partaken of by the warriors of the tribe with cries and gestures of exultation. Their thievish and murderous propensities early involved them in war with the settlers of Austin Colony, by whom they were repeatedly defeated with severe loss, in consequence of which, about the year 1825, they fled west of San Antonio River, whither they were pursued by Austin at the head of a strong party of his colonists. When he arrived at the Manahuila Creek, 6 miles east of Galliad—then called La Bahia—he was met by a Catholic priest of that place, who bore a proposition from the Carancaways, that if Austin would desist from hostilities they would never in future range east of the San Antonio.

Austin agreed to this proposition and countermarched his force. The Carancaways, however, did not long keep their promise. A few years afterwards several parties of them returned to the Colorado, their favorite resort, and committed divers thefts and atrocious murders, for which they weie again severely scourged by the colonists.

Efforts were long made by the Catholic missionaries to christianize these savages, and the mission of Refugio, 30 miles south of Galliad, was, I believe, founded for that special purpose. But the Carancaways were proof against all civilizing influences. At length, about the year 1843, forty or fifty men, women, and children—the sole remnant of this tribe, which twenty-one years before numbered nearly a thousand souls—emigrated to Mexico, and were permitted to settle in the interior of the State of Tamaulipas. At this time it is not improbable that the Carancaways are almost, if not quite, extinct. I am unable to ascertain whether any of the other tribes mentioned before in this paper are also verging on extinction, but it is well known that they have all rapidly diminished in numbers since they came in contact with civilization, and the conclusion is inevitable that in a score or two of years all the smaller tribes will become as extinct as the mammoth and the mastodon that preceded them.

MOUNDS, WORKSHOPS, AND STONE-HEAPS IN JEFFERSON COUNTY, ALABAMA.

By William Gesner, *of Birmingham, Alabama.*

Three mounds are to be seen in township 17, range 1 west, of Jefferson County, about 4 miles north of Birmingham, and west of the South and North Alabama Railroad, in that portion of Jones Valley through which flows Village Creek from east to west. They are on the north side of the creek where it is forded, on the Birmingham and Huntsville wagon road, and west of the machinery and buildings of the Birmingham Water Works Company about 1 mile. The largest of them is nearest to, and visible from, this road toward the west. The one, which is the most southerly of the group, appears to be about 30 feet high, conical, and about 100 feet in diameter at its base; the others, distant from it and from each other, about 300 yards, are not in a direct line with each other. The second one north has not one-third the dimension of the first, and the third is much smaller than the second. They are situated on the plain of one of the most fertile tracts of land in Jones Valley, which has been cultivated for more than fifty years.

Five Mile Creek, also flowing from east to west, through the hills, from out of this Jones anticlinal Valley, along the base of low ridges of Millstone Grit, bordering the Warrior Coal Field on the southeast, being crossed at Boyles Gap, on the South and North Alabama Railroad, places these mounds between two streams, abounding in fish, and tributary to the Black Warrior River. Their immediate locality is unsurpassed by any other region of the State for number, size, clearness, and coolness of the springs, issuing from out both the ridges of Silurian quartzites, and beds of limestone outcropping in the valley. They have been injured to some extent by hunters and farming operations, particularly the smallest one, but the largest one has oaks and other trees of large dimensions on it, growing without thriving. No explorations having been made of any of them, their arrangement and composition remain unknown.

Workshops.—In township 18, range 7 east, of Talladega County, on the headwaters of Talladega Creek, at the eastern end of Cedar Ridge, (a spur of the Rebecca Potsdam sandstone Mountain) in the old fields where the Montgomery Mining & Manufacturing Company's, Sulphur, Bluestone, Copperas, and Alum Works were situated, wagon loads of quartz fragments, broken arrow-heads, and spear-points, cover the ground; but on a much larger scale appears to have been the manufactory of these implements in township 19, range 27 east, of Lee County, on the Columbus Georgia branch of the Western Railroad east of Yongesborough; for in the fields, on the southeastern side of a low ridge called Storees Mountain, many acres are covered with the broken quartz, in every variety of that mineral found in this hill, from transparent rock crystal to jasper and chalcedony; among which occasional good implements occur.

Stone-heaps.—In township 23, range 14 east, of Chilton County, on the middle prong of Yellowleaf Creek, about 3½ miles northeast of Jemison Station, on the South and North Alabama Railroad, there are three stone heaps. The first one is about 100 yards from and on the west bank, being about 20 feet in diameter, and from 4 to 5 feet high at the center, with a post oak and pine growing on it of ancient appearance, and each of them about 8 inches in stump measurement. Two others nearly west of this, distant about 700 yards on the eastern brow of the ridge, are about 100 yards apart; one of them about 10 and the other 20 feet in diameter at the base and from 4 to 5 feet high at the center, which, though in the primitive forest, have no trees growing on them. Another, 1 mile east of these, on a more westerly ridge, in the same range and township, is about 50 feet in diameter at the base and over 5 feet high at the center. In township 21, range 3 west, on the quartzite ridge east of Siluria (about 1 mile), on the South and North Alabama Railroad, occurs a smaller stone heap than any of those before mentioned, supposed to be the grave of an Indian warrior.

ABORIGINAL SOAPSTONE QUARRY AND SHELL-HEAPS IN ALABAMA.

By Charles Mohr, *of Mobile, Alabama.*

In the course of a mineralogical trip through the region of metamorphic rocks in this state, stopping at Dudleyville, Tallapoosa County, I heard much of an ancient soapstone quarry, worked by a race of which, according to the statements of the first settlers amongst the Creeks and Muscogees, no tradition existed among these tribes. I was urgently pressed, but could not go, to visit the quarry myself, so it is due to Dr. Johnston, of Dudleyville, that I am enabled to make this contribution. The gentleman writes: "I picked up the large fragments near excavations in the rock from the very place where the ancient stonecutter left his rude and unfinished work." Allusion to these so called soapstone excavations and pottery is made in the second biennial report on the Geology of Alabama, by Professor Toumey, 1858, and also in the first report of the Progress of Geological Survey of Alabama, by Dr. E. Smith, 1874, pages, 86, 94, and 118. The rock from which this specimen has been quarried is rather a fibrous serpentine, intermixed partly with an asbestoid actinite than a soapstone. A stone chisel has, according to the statement of Dr. Johnston, been found in the soapstone quarries, and was undoubtedly an instrument used in cutting and dressing the vessels, and is of a porphyritic or dioritic rock foreign to the geological formation in that section.

I found a peculiar tablet of indurated ferruginous clay, the straight lines along the margin of which would lead one to think that it was used for a tally, worn around the neck suspended by a string. It was found in an old field on the western shore of Mobile Bay, near Magnolia race course. In this county two kinds of shell-banks or shell-mounds are met with.

The first are situated in the low marshes of the delta of Mobile River, first recognized as artificial accumulations of shells, and described as the gnathodon beds by Professor Toumey in his second biennial report on Geology of Alabama, 1858. He mentions the same at the time of his visit extending over several acres of ground, and some with an elevation of from 10 to 20 feet, presenting the shape of truncated cones, covered with a growth of native forest trees. These beds are almost entirely made of the shells of *Gnathodon cuneatus*, but in some quantities of stone of *Cyrena carolinensis* and the *Neritina reclivata* have served in a less degree to swell those accumulations; together with these, charcoal, ashes, and the bones of birds and animals are found. Relics of the handicraft of the builders of these shell-mounds are almost unknown. Professor Toumey speaks of an instrument cut from the shell of the *Pyrula ficus* which he found 10 feet below the surface, and of scarce fragments of pottery. These beds are, at this day, almost all levelled to the ground, and are rapidly disappearing, many having been appropriated as excellent sites for market gardens, and vast quantities of shells have been, and are still, removed for the construction of our shell-roads. The time is rapidly approaching when scarce any vestige will be left of them, and it is therefore most to be wished that the little of what yet remains should be closely investigated, and a minute account be put upon permanent record.

The other shell-banks are situated on the eastern and western shores of Mobile Bay, and along the coast of the Mississippi sound to the mouth of the Pascagoula. They are all above tide-water on dry land, contiguous to the extensive oyster beds in these waters, and composed exclusively of the oyster. The most interesting and the most extensive of these accumulations made by the ancient Ostreaphagi is found on the north side of the Bayou Cock d'Indes near its mouth, a few miles distant from Bayou La Batterie, in the extreme southern part of this county. But comparatively a small part of the large mound is left, and what remains serves as a beautiful site for a farm house, shaded by magnificent live oaks of the growth perhaps of scores of decades, offering under their shade, from an elevation of from 25 to 35 feet, a fine view of the surrounding country, and the island-studded waters of the Gulf. A quarter of a century ago these banks furnished this city for years with lime for building, and are still much used for the construction of roadbeds; having, however, passed of late years into the hands of farmers, the application of lime for agricultural purposes tends now, more than anything else, to their demolition and rapid disappearance. Considerable quantities of remains of the industries of these shell-bank builders have been found, mostly in the shape of ornamental pottery, as testified by a collection of these relics in the hands of Major Walthall. They consist of a pipe, bowls, handles of pots, mouthpieces of jars, representing heads of birds and animals, and human heads with a most characteristic and impressive cast of features, reminding me strongly of the faces of Mexican idols. Some of these are almost indentical with those mentioned by Mr. Putman, in his report on the Peabody Museum of Archæology and Ethnology, published in the June number of the American Naturalist, and figured under Nos. 7775–76, specimens representing female heads bearing the very same features and the same style of head-dress as No. 7778. They are all made of soft clay found on the bay shore, mixed with very small particles of burnt shell. What interested me mostly in looking over these remains is the occurrence of the same double concave, rounded, and polished disks, agreeing exactly with those of No. 7838 in the same paper.

I learn that near Mount Vernon Arsenal, 30 miles distant from this city, and about 3½ miles from the Alabama River, are ancient burial grounds, and that the exploration of the same has, from time to time, been attempted by different persons, I do not know with what result.

SILVER CROSSES FROM AN INDIAN GRAVE-MOUND AT COOSAWATTEE OLD TOWN, MURRAY COUNTY, GEORGIA.

By Charles C. Jones, Jr., LL.D., *Augusta, Ga.*

The two silver crosses, correct representations* of which are herewith presented, were taken, in November, 1832, from a grave-mound at Coosawattee Old Town, in Murray County, Georgia. Indian relics were found associated with them. We incline to the opinion that they may properly be referred to the expedition of Hernando de Soto.

If we interpret aright the wanderings of the Adelantado over the territory embraced within the geographical limits of the modern State of Georgia, his command halted for a while at the precise spot where these objects were obtained; and thence, moving down the valley of the Oostanaula, reached Chiaha, the site of the present town of Rome, where De Soto tarried during the month of June, 1540, to recruit his men and animals.

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* These drawings are half-size, and delineate both faces of each cross.

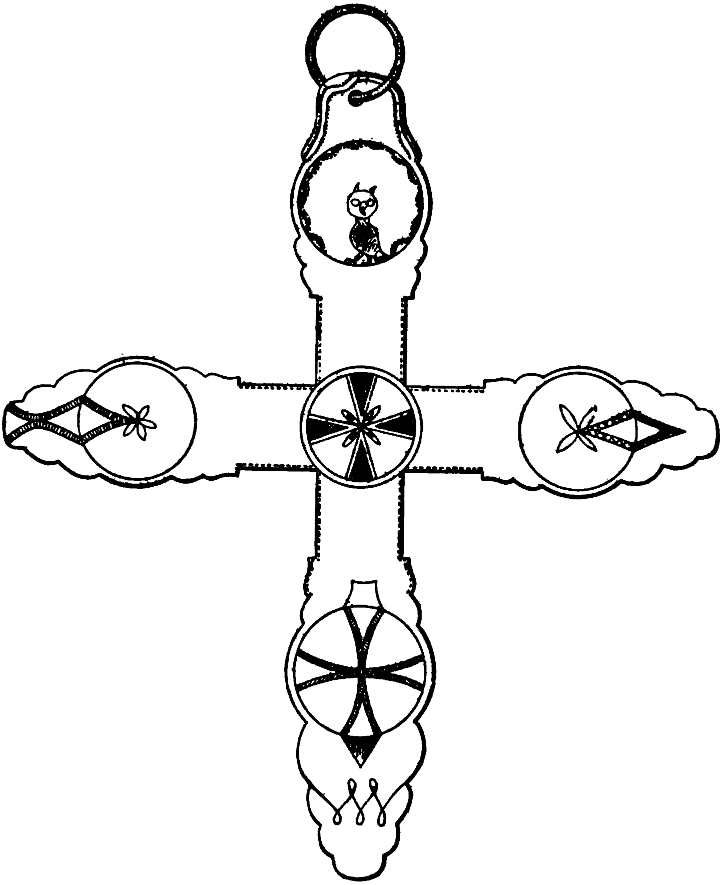


FIG. A 1.

In the Spanish narrative we are informed that before entering the village of Canasagua the strangers were met by twenty natives, each bearing a basket of mulberries.

Now, this name *Canasagua* lives to-day, and is borne by the *Connasagua River*, which, uniting with the Coosawattee, forms the Oostanaula. Coosawattee Old Town is located not far above the confluence of these streams. Within the historic period it continued to be a favorite abode of the Cherokee Indians.

In the neighboring county of Habersham, metallic objects of European manufacture have been unearthed under such circumstances that we feel justified in attributing them to the companions either of De Soto or of Louis de Velasco.

It is a well-established fact that twelve priests, eight clergymen of inferior rank, and four monks accompanied the Adelantado's army. We are assured that the conversion of the natives was one of the avowed purposes of the expedition. These clerical gentlemen were supplied with crucifixes, crosses, and rosaries, which they employed about, and distributed during the course of, their religious labors. That some effort was made to indoctrinate the aborigines in the mysteries of Christianity, and to lead them to look upon the cross as a symbol of peace, we are distinctly advised. Witness the erection of large wooden crosses, and the teachings of the priests at Achese, at Casqui, in the province of Icasqui, and elsewhere.

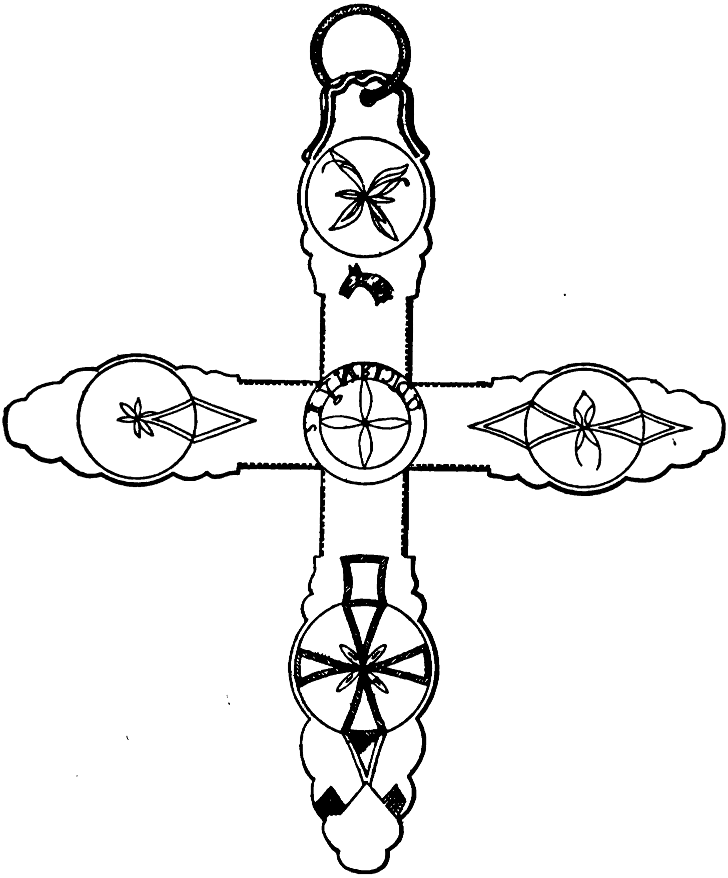


FIG. A 2.

It appears by no means improbable that these crosses were presented by the Spanish clergymen of the expedition to prominent Indians—reckoned as converts at the time—and that their fellows, in obedience to a custom long established and maintained even to the present moment, upon the death of the fortunate owners, buried them in the grave-mounds erected for their sepulture.

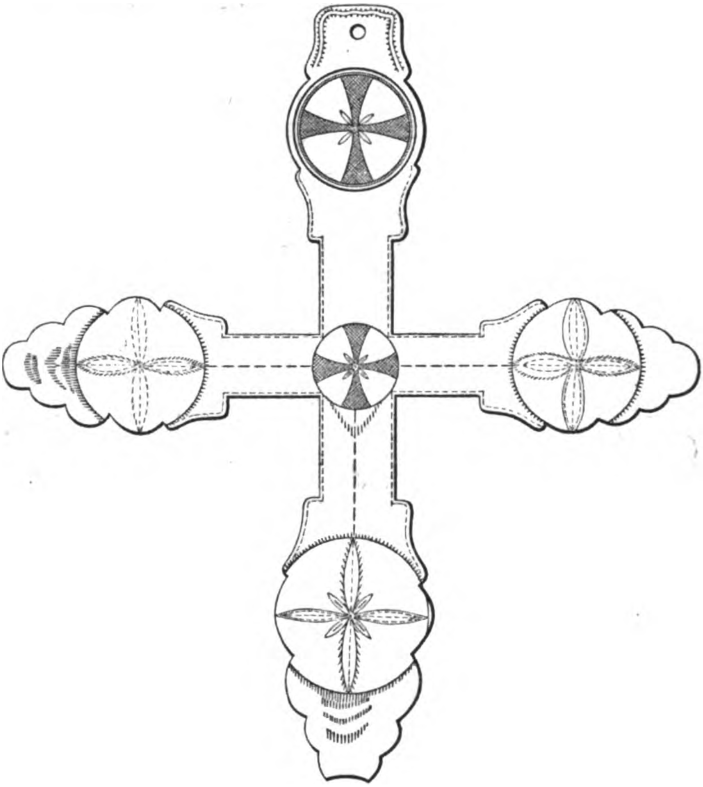


FIG. B 1.

We regret that we have no suitable references at hand which would enable us to determine, at least approximatively, the date of the manufacture of these crosses. The silver of which they are made is seemingly quite pure, and each cross is about the thirtieth of an inch in thickness.

Some intrusive engraving appears on the face of one of these objects. Behold the delineation of the head and neck of a *horse!* Even the most superficial examination will convince any one that this figure was not made with the graver's tool which wrought the other ornamentations, but that it was more rudely done, and, in all likelihood, with the sharp point of a flint flake.

Why an *owl* should have been figured on the other face of this cross, I know not. Were this a Roman relic our wonder would not be excited.

We are at a loss to suggest a satisfactory interpretation of the inscription appearing in the center of one of the faces of the cross which still retains its ring for suspension. Can it be a rude tracing by the donor, on the spur of the moment, of the name of the Indian to whom the cross was presented? This inscription has an illiterate, unskillful, and hasty look about it. It is not a of a kind with the rest of the engraving, and was certainly added after the completion of the object. Written from left to right, it runs as follows: IYNKICIDU. Read from right to left, we have UDICIKNYI. In either case, by a slight exercise of the imagination, we have a name with a traditional aboriginal ring about it. Manifestly these letters were not within the double circle when the cross passed from the shop of the silversmith, and we are persuaded that both a clumsy tool and an unskilled hand were employed in their superscription.

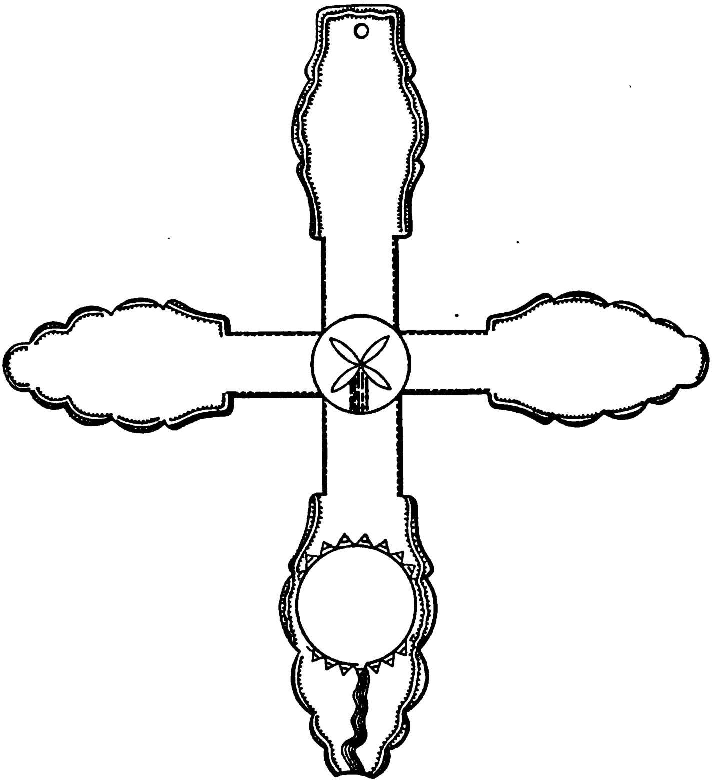


FIG. B 2.

As we well know, the Florida tribes were wholly unacquainted with the *horse* prior to the advent of the European. To them, therefore, on its first appearance, this quadruped must have proved an object of special interest and wonder. These silver ornaments, too, were doubtless held in high esteem, because, in beauty of material, symmetry of form, and excellency of manufacture, they far excelled all the products of aboriginal fabrication.

May we not suggest that the native, into whose ownership one of these crosses passed, endeavored with a flint flake to perpetuate his recollection of this animal which, in his esteem, was not less remarkable than the pale-faced stranger or his shining gift? We cannot resist the impression that this equinal delineation was the work of an Indian.

THE GREAT MOUND ON THE ETOWAH RIVER, GEORGIA.

By CHARLES WHITTLESEY, *of Cleveland, Ohio.*

Not having seen a detailed description of this mound, I made a visit to it in behalf of the Western Reserve Historical Society in May, 1871. It stands upon the north bank of the Etowah, about 2 miles below where it is crossed by the Chattanooga and Atlanta Railway, near Cartersville. Its form, size, and elevation are singular and imposing. It occupies the easterly point or angle of a large and luxuriant river bottom, a part of which is subject to inundations. The soil is a deep, rich, black loam, covering several hundred acres, which has been cultivated in corn and cotton since the Cherokees left it about forty years since.

I was compelled, by bad weather, to make the survey in haste. The bearings were taken with a prismatic compass, the distances measured by pacing, and the elevations obtained with a pocket level. They are therefore subject to the corrections of future surveyors. Its base covers a space of about 3 acres, and stands at a level of 23 feet above low water in the river. In great floods the water approaches near the mound on

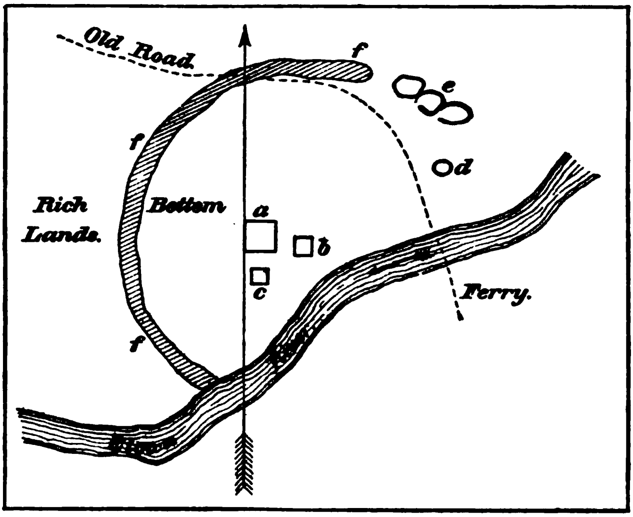


FIG. 1.

the west, but has not been known to reach it. The body of the mound has an irregular figure, as shown in the plan. It is longest on the meridian, its diameter in that direction being about 270 feet. On the top is a nearly level area of about an acre, the average height of which is 50 feet above the base. A broad ramp or graded way (1) winds upward from the plain, around the south face of the mound, to the area on the top.

Like some of the pyramids of Egypt, it has two smaller ones as tenders: one on the south, *C;* another to the southeast, *B;* each about 100 feet distant, their bases nearly square, and of nearly equal dimensions. If they were not in the shadow of the great mound they would attract attention for their size and regularity. The ground at *B* is 3 feet higher than at *C*. All of them are truncated. The mound *C* is not a perfectly regular figure, but approaches a square, with one side broken into three lines. Its height above base is 18 feet. The bearing of its western side is north 10° west, and the length on the ground 47 paces, having been somewhat spread out by plowing around the foot. On the east is a ramp, with a slope of one to two degrees which allows of ready ascent by persons on foot.

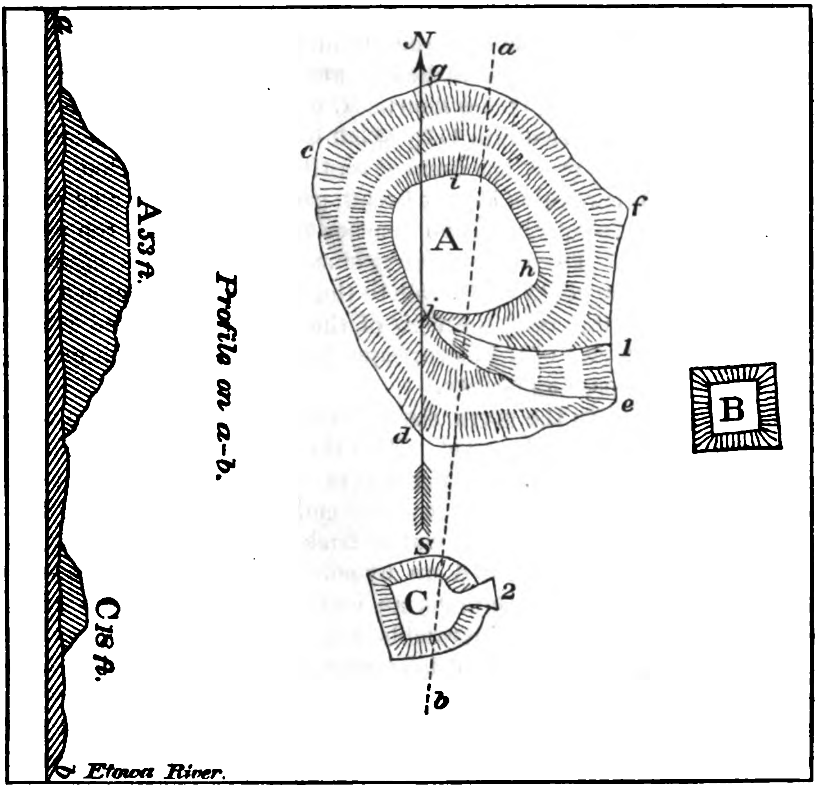


FIG. 2.

The slopes of all the mounds are very steep and quite perfect, in some places still standing at an angle of 45°. *B* is a regular truncated pyramid, with a square base about 106 feet on a side, two of the faces bearing 5° west of the meridian. Its elevation is 22 feet. There is no ramp, or place of ascent which is less steep than the general slopes.

Towards the southeast corner of the surface of *B* is a sunken place as though a vault had fallen in.

The proprietor has managed to cultivate the summits of all the mounds, regarding the group in the light of a continual injury by the loss of several acres of ground. Most of the material of the mounds is the rich black mold of the bottom land, with occasional lumps of red clay. The soil on their sides and summits produces corn, cotton, grass, vines, and bushes in full luxuriance. The perimeter of the base of the great mound is 534 paces. As the ground had been recently plowed and was soaked with a deluge of rain, a pace will represent little more than 2 feet. I give the circumference provisionally at 370 yards. The area on the top is like the base, oblong north and south, but its figure is more regular. Its perimeter is 231 paces.

From the center of the pyramid *C* a line on the magnetic meridian passes a few feet to the west of the center of the platform on the summit of *A*. Its sides are nowhere washed or gullied by rains. Prior to the clearing of the land, large trees flourished on the top and on the slopes. I estimate its mass to contain 117,000 cubic yards, which is about four-fifths of the Prussian earth monument on the field of Waterloo.

At the base the ramp is 50 feet broad, growing narrower as you ascend. It curves to the right, and reaches the area on the top near its southwest corner. Twenty-five years since, before it was injured by cultivation, visitors could easily ride to the summit on horseback along the ramp. From this spot the view of the rich valley of the Etowah, towards the west, and of the picturesque hills which border it on either side, is one of surpassing beauty.

About 300 yards to the north rises the second terrace of the valley, composed of red clay and gravel. Near the foot of it are the remains of a ditch, inclosing this group of mounds in an arc of a circle, at a distance of about 200 yards. The western end rests on the river below the mounds, into which the high waters back up a considerable distance.

It has been principally filled up by cultivation. The owner of the premises says there was originally an embankment along the edge of the ditch on the side of the pyramids, but other old settlers say there was none. If the last statement is correct, a part of the earth composing the mounds can be accounted for by the ditch.

Its length is about one-fourth of a mile, and it does not extend to the river above the mounds. Near the upper end are two oblong irregular pits, 12 to 15 feet deep, from which a part of the earth of the mounds may have been taken. The diameter of the pits varies from 150 to 200 feet, and the breadth from 60 to 70. The ditch is reputed to have been 30 feet wide and 10 feet deep. Two hundred yards to the northeast of

A are the remains of four low mounds within the ditch, near the large pits. Five hundred yards to the northwest, on the edge of the second terrace, is a mound which is yet 8 feet high, although it has been industriously plowed over more than thirty years. On the opposite side of the river, one-fourth of a mile below, and on the same side 2 miles below, are said to be small mounds.

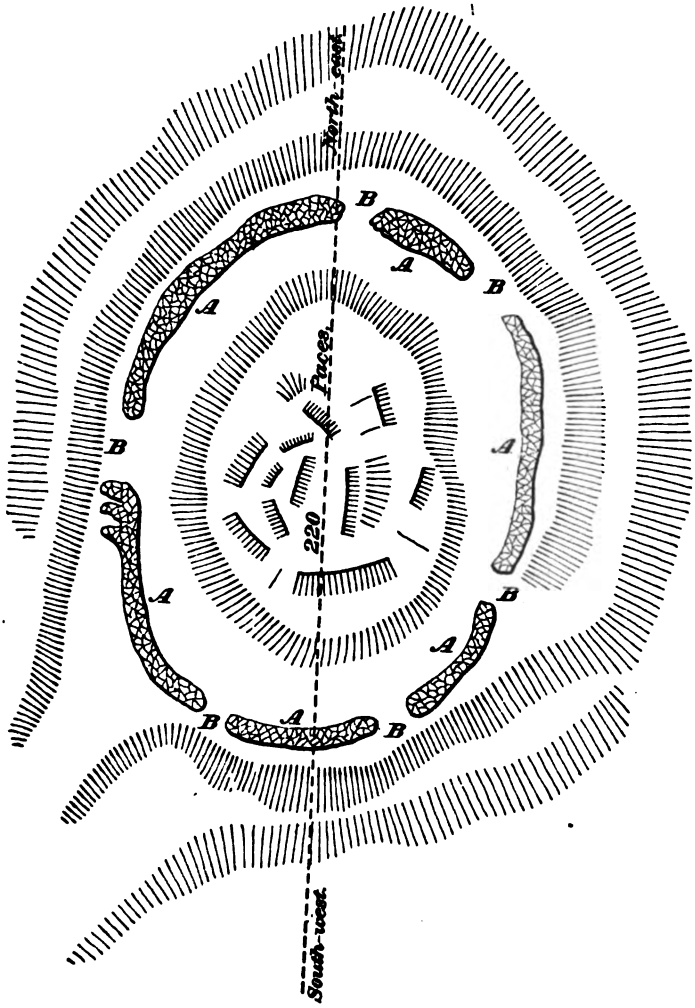


FIG. 3.

On the summit of a rocky hill, 2½ miles northwest, which overlooks the valley of the Etowah towards Rome, and also the hill country on the south, is an inclosure of loose unhewn stones, known as the "Indian Fort." It has now the appearance of a heavy stone fence which has fallen down. There are six openings or entrances, *B B B*, having a breadth of 10 to 60 feet, situated at irregular distances. It is an irregular oval figure inclosing the rocky summit of the hill, the largest diameter of which is 220 paces and the shorter 200. The elevation of the knob, at the center, is 50 feet above the terrace or bench, on which the lines of loose stones are lying. This interior space is principally cleared of loose stone, and shows bare ledges of lime rock, in horizontal layers.

The hill is covered with an open growth of oaks. There is nothing in this structure suggestive of a fort, except its elevated position, which, however, is by no means inaccessible. The openings are too wide and too numerous to warrant the idea of a defensive work. It is more probable that it was the scene of imposing public processions and displays, and was approached by crowds of persons from all sides through the openings. The rude wall or line of stones would be the necessary result of clearing the ground of the blocks of limestone once scattered profusely over the surface.

Near where the railway from Cartersville to Cedarville crosses Petit's Creek, at the base of the limestone bluff, about half a mile east of the "fort," is an artificial pile of small stones, which was once about 18 feet in height. It is now very much injured by persons in search of treasure and of relics, who have formed a crater at the center nearly down to the ground, throwing the stones over the sides. It must have been a regular cone, with smaller heaps attached around its base, which was irregular, and about 160 feet in circumference. This mound of stones does not differ from those raised by the red men over the remains of their dead chiefs except in size.

A few days before I was at the great mound, a rude stone effigy of a female was plowed out near its base on the north side. It is quite grotesque, resembling the uncouth carvings in wood of the Indians of the north. Its height is 14 inches, its weight 36 pounds, and the material is the limestone of the region.

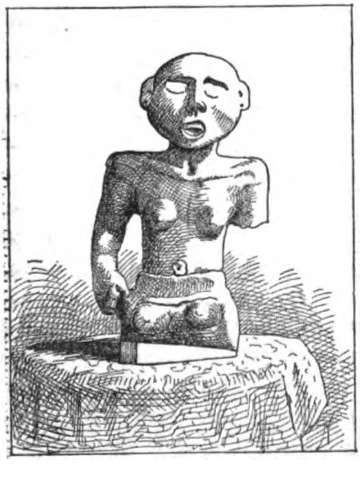


FIG. 4.

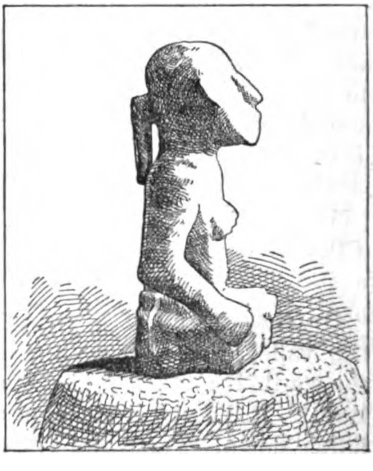


FIG. 5.

I have a photograph of it, viewed on three sides. On the hips and back are colored zigzag lines of white and brown, intended for ornament. Some years since a male, probably the mate to it, was plowed out near the same place; also an earthen vase and other pottery, with flint disks. The first-found image was lost or destroyed, and the other soon will be. In style and artistic execution they appear to be the work of the present red man.

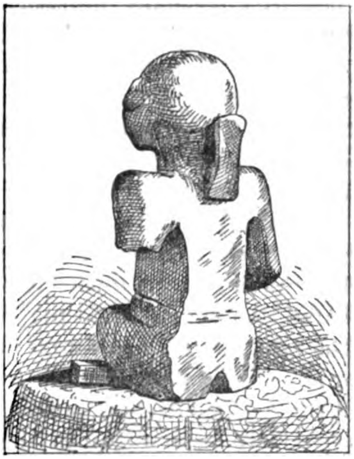


FIG. 6.

Mr. Tumlin, the owner of the premises, and Mr. Sage, of Cartersville, who knew the country while the Cherokees were in possession of it, state that the summit of the great pyramid was a fortified village, surrounded by pickets of wood and a slight embankment. This parapet is still visible, but is, at least in part, owing to furrows turned outward in plowing, and, until recently, the stumps of the pickets were struck by the plow. Near the southeast corner of the area, on the top, is a low mound. It is a third of a mile, at the nearest point, to where there is land of a height equal to the mound, and therefore it was a place easily defended. Although the Cherokees made use of it as a fort against the Creeks, they always denied having any knowledge of the race or the persons by whom the mound was erected. The gentlemen above named questioned them repeatedly on this point, and always received the same answer. If it had been designed as a place of defense originally, a much less broad and gentle road to the summit would have been made.

I was attracted to this mound and its surroundings as a type of the flat-top pyramids, so common on the waters of the Gulf of Mexico, which have been by some archæologists attributed to the present race of red men. In Florida and in Alabama, the early English and Spanish travelers found Indian caciques with their wigwams on the top of such mounds, around which were the villages of their tribe. Instances are given where Indian towns occupied spaces surrounded by ancient embankments of earth, both with and without mounds.

Mr. S. F. Haven, long distinguished in archæology as the secretary of the American Antiquarian Society at Worcester, Mass., in his article in the Smithsonian Contributions for 1855, vol. viii, has referred to an instance of an intrenched fort made by the Arickarees, in a bend of the Missouri River, above Council Bluffs. The description of this fort by Lewis and Clark does not give it the character of an earthwork with ditches for defense. It was a temporary breastwork of logs and earth and stone, hastily thrown up, such as are common in Indian warfare, and in all warfare.

The Indian forts which were attacked by Champlain in northeastern New York in 1609 were constructed of pickets set in a low bank, strengthened by interlacing branches and poles, secured by bark and withes. During the French wars with the Iroquois, on the waters of Lake Ontario, they met with nothing more advanced than these light stockades. The pickets were set in the earth, and the bank raised against them from both sides, to give them a more firm support. In no case was the bank or ditch relied upon as a protection or as an obstacle to those without. They were of a profile too slight for this purpose.

The northwestern Indians have been questioned in numerous instances as to the authors of the earthworks of the West. They universally deny having any knowledge or tradition of the persons who built them; a tradition which could not have been lost, or the art of making them. The relics which are found in the mounds, in connection with the first or oldest burials, although there are resemblances, differ from the relics of the red men in many particulars. If stone axes or mauls of the Indian type have been found in the mounds, they are rare. The last-named race were not miners of copper or copper-workers. In the implements of the two races there are resemblances, especially in those which are made of flint, but no greater than in those of the ancient races in Europe, where no connection is claimed.

It cannot, however, be denied that continued investigations bring to light a strong similarity between the works of the ancient tribes of the South and the mound-builders. If the dividing line shall be broken down as to them, there is a wide difference between the northern tribes and the mound-builders.

Col. C. C. Jones, of Atlanta, Ga., in his valuable work on the Southern Indians (1874), has given historical proof to show that the Spaniards were witnesses to the erection of such mounds.

Most of the above descriptive matter is an abstract of my remarks at the Chicago meeting of the American Association, in August, 1871, before the appearance of the book of Colonel Jones. The drawings used at the meeting have been reduced by photograph for this paper. I take pleasure in referring to his work (pages 137 to 143) for details not in my description, especially the artificial ponds *D D*, and the mound *E* inclosed by the moat. The cavities *E E E* of my sketch are the ponds *P* of Colonel Jones, but at the time of my visit were without water. There is but one ascent to the platform *A*, which is represented at 1, e j, and is in very good condition. Fort Hill no doubt had a relation to this group of mounds answering to the high places of worship which are common in Palestine.

NEW RIVER MOUNDS, BERRIEN COUNTY, GEORGIA.

By William J. Taylor, *of Nashville, Ga.*

The mounds described in this paper, two in number, are situated on a dry sandy level of pine and oak land near the edge of a hummock which skirts the creek in the ninth district of Berrien County, Georgia. They are about 300 yards from the creek and 100 yards from a branch emptying into the creek. This site is on lot numbered 275, and 6 miles southwest from the town of Nashville.

The mounds had been partially explored previously to our examination, but the following is an account of our results:

Mound No. 1 was 30 feet wide and 4 feet high, and perfectly circular at the base. The earth composing it was obtained from a saucer-shaped excavation, now 8 feet across and 1 foot deep. At the bottom of this depression were found charred wood, ashes, and pieces of burnt pine wood, which appeared to have been placed there when the interment was made.

Mound No. 2 resembled No. 1 in every respect. The growth on both mounds were wire-grass, sedge, bushes of the red oak and post oak. The early settlers and the Indians whom they encountered were alike ignorant of the origin of these relics of the past.

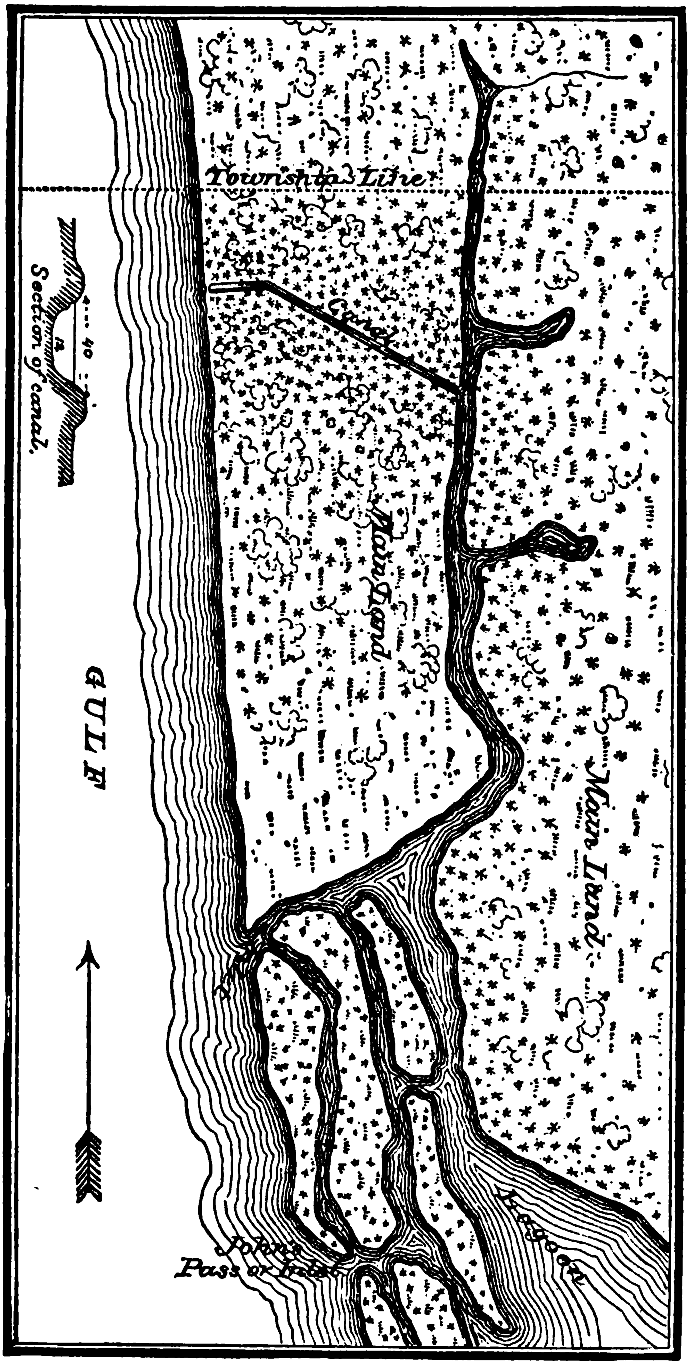
ANCIENT CANALS IN FLORIDA.

By Charles J. Kenworthy, *of Jacksonville, Fla.*

In November and December, 1877, I indulged in a sail-boat cruise from Key West to Cedar Keys, and *en route* found and superficially examined an ancient canal in township 50 south, range 25 east. The accompanying drawing gives a sketch of the locality.

The canal is at present 12 feet wide at the bottom, and about 40 at the top. The embankment on each side is about 4 feet higher than the original surface. Engineering skill was manifested in laying out the canal, for its first 600 feet are at right angles with the coast line, after which it trends to the eastward. Those canals were not erected by our indolent Indians, and in my opinion they were made by another race. Three years ago I made a boat trip from Cedar Keys to Charlotte Harbor, on Lake Okeechobee. On my return I superficially examined a canal at Pine Island, Charlotte Harbor.

Some of the largest mounds in the State have been constructed near the southwest end of the canal. In my opinion the mounds have been made since the canal was excavated. I was anxious to make an examination to determine the date of the mound-building as regards the canal,

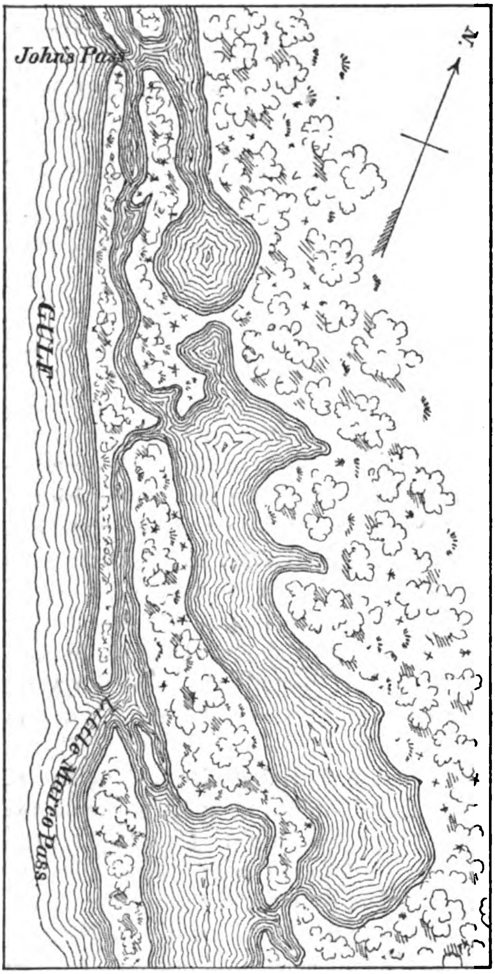

Township Line
Canal
Section of canal.
40
Main Land
GULF
Main Land
John's Pass or Inlet
Lagoon

PLAN No. 1.

but my companions would not stop. I was assured, by a gentleman who had resided on the island for 24 years, that the canal extended across the island a distance of 3 miles, and that it could be traced inland (from the shore of the mainland) a distance of 14 miles. A canal similar in character exists between the falls at the head of the Caloosahatchee and Lake Okeechobee. An old coaster informed me that he had discerned an ancient canal on one of the Thousand Islands south of Cape Romano. Those excavations are evidently very old and not the work of Indians. They were not constructed for defensive purposes, but evidently for canals.

In his examinations, Professor Wyman did not visit the large mounds of the State. The largest of those standing are to be found on Pine Island and Gasparilla Island, Charlotte Harbor, at Old Fort Centre, Fish Eating Creek, on the plain between New Fort Centre and Fort Thompson, and between Fort Myers and Cyprus Bay. The mound at Old Fort Centre is about 50 feet high. It was evidently used for burial purposes, and if an excavation was made many things might be collected. I used a stick, and with a few minutes' scratching I found bones everywhere. The largest and most interesting mounds in the State have escaped notice and examination. From the immense number and large size of the shell heaps on the southwest coast, this section must have been inhabited for a long period by a large population. The distribution of the shells in some of the heaps led me to believe that the inhabitants were governed by some law.. In some of the heaps you will find a layer of conch shells several feet in thickness, and above or below a layer of oyster shells. The largest number of shell mounds are to be found on the Nelt River, a lagoon or river connecting Crystal and Henoosana Rivers.

In my wanderings I found a remarkable shell deposit on the shore of Orange Lake. I noticed an elevation on the flat near the shore of the lake, covering over an acre and about 6 feet high. I noticed on the surface fragments of oyster shells. I obtained a grubbing hoe and made an excavation about 2 feet deep, and found a bed of oyster shells. They differed from other shells I have examined in other portions of the State. As far as examined, each shell had been broken at the end, as oysters were opened some years ago. The present elevation of Orange Lake is 48 feet 8 inches above the ocean level. The nearest oyster bed is distant 43 miles. This immense heap of shells was not transported 43 miles, but in my opinion were obtained from Orange Lake when it was a bay or estuary of the sea. From my investigations I feel assured that the oysters were collected and eaten when the State of Florida consisted of a belt of high land extending from the Chattahoochee to a point south of Sumterville, and before the balance of the State attained its present elevation above the ocean. If my views are correct, Florida was inhabited a long time ago. If the shells referred to have not presented the endeavors of man's work I might have referred the collection to other causes. Two years ago I made the acquaintance of a very intelligent gentleman residing near Sumterville. Four years ago he was out deer hunting with dogs on the shore of Lake Charleossos-skie. He was riding over an elevated hummock surrounded by a large sun-grass swamp, and discovered traces of old cultivation. Looking about, he discovered a heap of ancient pottery, which, he assured me, amounted to several cart-loads. He dismounted and examined a number of the vessels, and found that a hole had been made in the bottom of each to render it useless. After examining a few of them he followed in pursuit of his dogs. It seems to me that this hummock must have been the resort of a tribe of Indians, and when attacked by enemies they rendered their most valuable utensils useless to the enemy.



PLAN No. 2.

He had in the city, some months since, a large molar tooth weighing 9 pounds. It was picked up near Sumterville. On some of the tributaries of Pease Creek huge bones are visible in the sand bars at low stages of water.

Plan No. 1 is an accurate sketch of the locality, showing the peninsula, inlet, lagoon, islands, and canals. Plan No. 2, on a smaller scale, shows John's Pass and Marco Inlet.

One mile and three-quarters south of Doctor's Pass is John's Pass, with three inside channels connecting them. Three miles and a quarter south of John's Pass is Little Marco Inlet, with an inside channel connecting them.

The land on the peninsula traversed by the canal is low, and poor pine land, not over 4 feet above high-water mark. From a passing examination of the mainland east of the lagoon it presented the appearance of low pine land unfit for cultivation. It is evident that no large settlement ever existed in the neighborhood of the canal. Unless marked changes have occurred in the land by the opening of passes since the excavation was made, there is no apparent reason why so much labor was bestowed on the work.

Along the Gulf shore, for a distance of 150 feet inland from high-water mark, there exists a flat sand bank about 4 feet above the general surface of the peninsula, and this deposit has apparently blocked up the Gulf end of the canal. The canal at the head of the Caloosahatchee connects with the river and ends abruptly inland.

The canal crossing Pine Island is less than 4 miles from its northern end, and there is no apparent object why the excavation was made. The width, depth, and general appearance of all the canals are the same.

MOUNDS IN ALACHUA COUNTY, FLORIDA.

BY JAMES BELL, *of Gainesville, Fla.*

There are at least fifty mounds within 20 miles of Gainesville, Florida. The accompanying sketch gives the location of six which have been examined, and of which the descriptions are given in this paper.

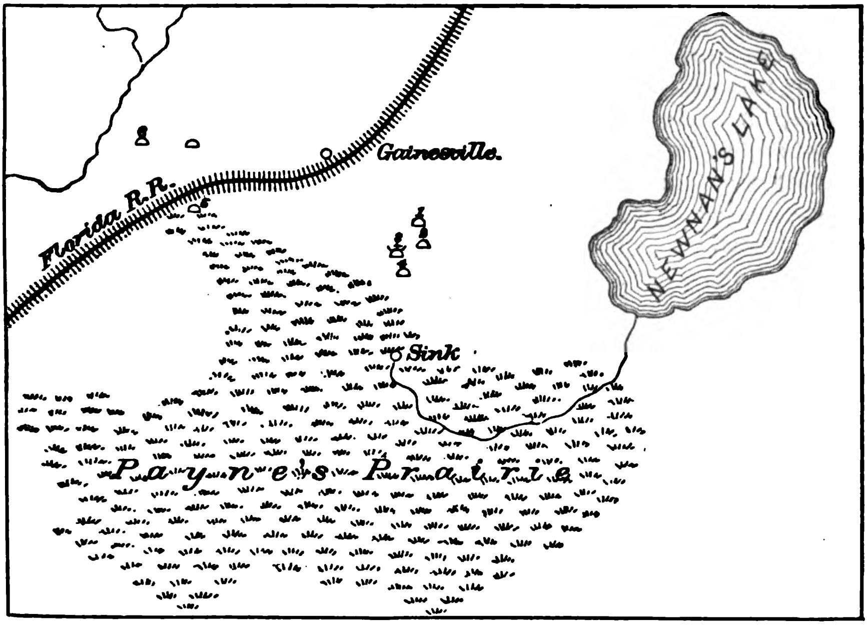


FIG. 1.

Mound No. 1 was 7 feet high and 30 feet in diameter, and located in a cleared field which has been plowed over for the last twenty years.

A shaft was sunk below the original surface. Openings were also made in the sides. But no relics whatever were found.

Mound No. 2 is situated in the same field 300 yards north of No. 1. It was at the time of its examination 10 feet high and about 95 feet in base diameter. Like No. 1, it had been much plowed over. A shaft was sunk in it below the base and extended laterally, but nothing was found excepting a few fragments of charcoal and pottery.

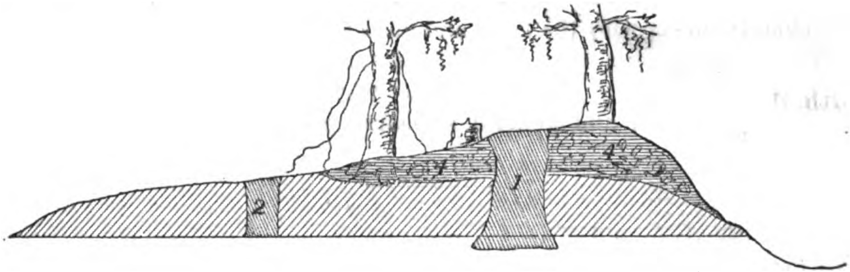


FIG. 2.—Mound No. 3—looking north (1 and 2=shafts: 4, 4=pottery.

Mound No. 3 is upon a hummock near its edge. It measures 12 feet in height, and 105 by 70 feet in base diameter. Being situated on the slope of the hummock, the summit of which overlooks the mound, this work seems to have escaped observation. A family living only 30 yards distant were very much surprised to find it a burial mound. Two large trees were growing on the top at the time of my visit, and the entire surface was covered with a dense growth of bushes and grape-vines. The accompanying sketch will convey a clear idea of its appearance. A shaft 6 feet in diameter was sunk to the original surface. After digging down about 10 inches broken pottery was encountered in great quantities, but so much shattered that it was impossible to restore a single vessel.

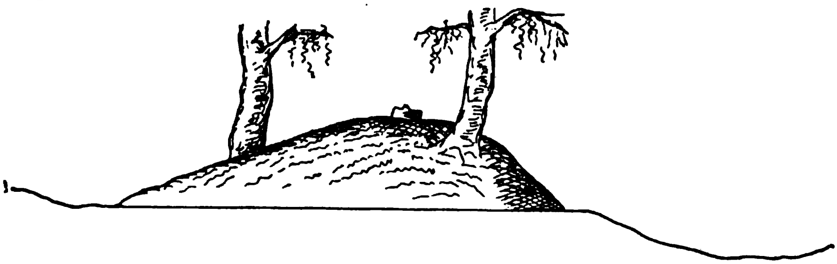


FIG. 3.—Mound No. 3—looking west.

The first bones were found about 15 or 18 inches from the surface. This stratum extended over the mound for a space 30 feet in diameter. There appeared to be three tiers of bones about a foot apart. The bodies had not been buried here; the bones seemed to have been thrown in promiscuously.

Being compelled to abandon my work for a season, other persons dug into this mound and recovered some valuable pottery. One large basin was made in imitation of a duck with wings and bill exposed.

Resuming the exploration, the surface was dug over for a space of 30 feet in diameter and 5 feet deep. Within that area not less than one thousand skeletons were exhumed and at least two wagon loads of potsherds. This pottery commenced about a foot from the surface and extended down to the first stratum of bones.

Mound No. 4 was only 4 feet high and 15 feet in base diameter. Upon examination it was found to contain no relics.

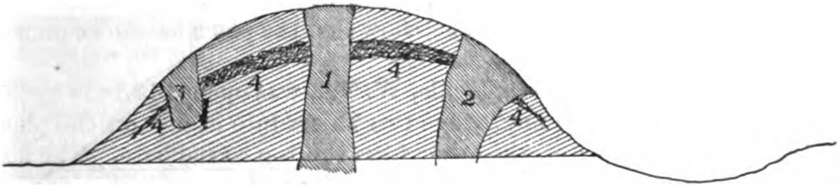


FIG. 4.—Mound No. 5—looking north (1, 2, 3=shafts: 4, 4, 4=charcoal and ashes.)

Mound No. 5 was 10 feet high and 32 feet in base diameter, and very symmetrically shaped. It was situated on a hummock about 50 yards from the margin of the arm of Payne's Prairie. This was formerly a lake, but about twenty years ago the water disappeared through the sink. It remained dry for about three years, when it filled with water and has remained a lake ever since. This mound was examined (see Fig. 4) and a stratum of ashes, charcoal, and charred bones encountered 3 feet from the surface.

Mound No. 6 was about 8 feet high and 80 feet in base diameter. It stood in a cleared field which had been plowed over for a number of years. Nothing was discovered within it, although a ditch was cut through from one side to the other.

SHELL DEPOSITS AT THE MOUTH OF SHORT CREEK, WEST VIRGINIA.

BY H. B. HUBBARD, *of Wheeling, W. Va.*

Short Creek is a little stream that enters the Ohio River 9 miles above the city of Wheeling, and the shell deposit alluded to commences to show in the bank of the river some 50 yards above the mouth of this creek, and is exposed for over 100 feet up the river, when it is hidden by a fill for a road down to the water. The shells are those of the fresh-water clam and are very fragile, splitting into fine scales on handling, though an occasional one is found that is perfect. The shells are now covered with about 3 feet of silt, and formerly there were 3 or 4 feet of the same loamy deposit over this, but it was removed in grading for a public road. A portion of this road, with much of the deposit of shells, has fallen into the river by the caving in of the bank.

While many of the usual indications which mark such deposits as artificial, such as the remains of fires, &c., are present, there are two peculiarities worthy of especial notice. One of which is a stratum of river bowlders which divides the deposit of shells, which is over 2 feet in thickness, into two very equal parts through its entire exposure. These bowlders were evidently selected with great care for uniformity in size and are about 3 inches in diameter, and are packed as closely as in a pavement. The remains of the fires show both above and below these bowlders, but none immediately upon them. The other peculiarity is the abundance of human bones found mixed with the shells, but these are probably of later origin, and, if so, show that the place has subsequently been used for a burial place.

The large mound at Moundsville, W. Va., was opened in 1838 by Mr. Tomlinson, who, in opening, drove two shafts into it, one on the plane of the base to its center, the other from the top to the base. The horizontal shaft was through a loamy clay as far as driven, which was some 12 or 15 feet at the time I was there, and for 3 or 4 feet in from the surface on the sides and top was marked with fine dark lines which formed segments of circles springing from each other in successive rows, after the manner of what is sometimes termed the "shell-pattern." These lines were from 12 to 16 inches from point to point of contact and 2½ to 3 inches apart at their greatest vertical separation. These lines suggested the idea that the mounds had been faced with turf. In support of this hypothesis, it would be necessary to remember the high angle of elevation of the faces of the mound, the height of the mound and the material of which it is composed, and while the angle of inclination of the faces is no more than nature willingly tolerates under such circumstances, yet, unless the faces were protected, they would be much wasted and gullied by the rains before they would be protected by spontaneous vegetation. The adaptation of the means to the end is apparent in the facility with which the material could be obtained and applied, and in the perfect protection which such a casing would afford.

ANTIQUITIES OF SOUTHWESTERN PENNSYLVANIA.

By Rev. Horace Hayden, *of West Brownsville, Pa.*

In view of the fact that in the States of Ohio, Indiana, and especially Wisconsin, ancient remains have been so carefully investigated, it must appear strange that the many *indicia* of a prehistoric race in the western part of Pennsylvania and in the State of West Virginia should be so little known. At the present date these *indicia* have been largely decreased by vandalism and by the action of the elements. Many mounds have been plowed down to the surface of the surrounding ground or leveled to make way for towns. Many of the remarkable sculptured rocks have been used for building purposes or are lying below the surface of the Monongahela River, even at low tide, the river being higher now at all seasons by reason of the slack-water improvements than it was forty years ago. The second geological report of Pennsylvania contains nothing on the subject of antiquities; Dr. Creigh, in his "History of Washington County," is entirely silent as to the numerous mounds, &c., which are found in the county limits; and the centennial volume of the "Resources of West Virginia," by Prof. M. F. Maury, ignores the many and exceedingly interesting remains in that State. I shall here, however, give simply an account of the antiquities of Fayette County, Pennsylvania, and, in another paper, of those in parts of West Virginia. This account will necessarily be taken largely from an unpublished work by Hon. James Veech and Freeman Lewis, the latter an old and experienced surveyor of Brownsville, Pa. Remains of embankments or "old forts" are numerous in Fayette County. The Indians known to us could give no satisfactory account of them. While the trees of the surrounding forests were chiefly oak, the growth upon and in the old forts was generally of large black walnut, wild cherry, and locust. Some indicate an age of three hundred to five hundred years, and some stood around the decayed remains of others. Judge Veech thinks they were originally composed of wood, as their *débris* is generally a vegetable mold, no stone being used in their construction. Old pottery, made of clay and mussel-shells, is always found among these ruins. The old forts were of various forms, square, oblong, triangular, circular, and semi-circular. Their sites were generally well chosen in reference to defense and observation, and, what is a singular fact, they were very often, generally in Fayette County, located on the highest and richest hills, and at a distance from any spring or stream of water.

One of these "old forts" was on the land of William Goe, near the Monongahela River, and just above the mouth of Little Redstone, where afterwards was a settlers' fort, called Cassell's or Castle Fort.

Another was situated at the mouth of Speers Run, where now stands the town of Belle Vernon. Two or three are found on a high ridge southwardly of Perryopolis, on the State road, and on land lately owned by John F. Martin.

Another noted one is on the west bank of the Youghiogheny River, nearly opposite the Brood ford, on land lately owned by James Collins. There are several on the high ridge of land leading from the Collins fort southwestwardly towards Plumsock, on lands of James Paull, John M. Austin, John Bute, and others, a remarkable one being on land lately owned by James Gilchrist and the Byers, where some very large human bones have been found.

There is one on the north side of Mountz Creek, above Irishman's Run. A very large one, containing 6 or 8 acres, is on the summit of Laurel Hill, where the mud pike crosses it, covered with a large growth of black walnut.

One especially noted as containing a great quantity of broken shells and pottery existed on the high land between Laurel run and the Youghiogheny River, on a tract formerly owned by Judge Young, and remains of the fort are to be seen. There are yet distinct traces of one on land of General Henry W. Beeson, formerly Colonel McClean's, about miles east of Uniontown.

There was one northeast of New Geneva, at the locality known as the "Flint Hill," on land now owned by John Franks.

Two miles northeast of New Geneva, on the road to Uniontown, and on land late of William Morris, now Nicholas B. Johnson, was one celebrated for its great abundance of mussel-shells. In the high ridge southwardly of the headwaters of Middle Run several existed, of which may be named one on the Bixler land, one on the high knob eastwardly of Clark Breading's, one on the Alexander Wilson tract, and one on the land of Dennis Riley, deceased, formerly Andrew C. Johnson's. Judge Veech also states that "a very noted 'old fort' and of most commanding location was at Brownsville, on the site of Fort Burd, but covering a much larger area. Even after Colonel Burd built his fort here, in 1759, it retained the name of the 'Old Fort,' *Redstone Old Fort, or Fort Redstone.*" I am quite sure that Judge Veech is in error in locating this old fort on the site of Fort Burd.

Of the antiquities immediately around Brownsville no trace at present remains. On the original draught of Fort Burd, made by Major Joseph Shippen in 1759, and now in the possession of the Historical Society of Pennsylvania, can be seen, immediately to the rear of Fort Burd, the old Indian Fort, which is now so entirely obliterated that very few remember where it was located. The fullest description of this earthwork is found in "Travels in America, performed in 1806, for the purpose of exploring the rivers Allegheny, Monongahela, Ohio, and Mississippi, &c., by Thomas Ashe, esq., London, 1808." In the fifth letter of this work the author says:

"The neighborhood of Brownsville or Redstone abounds with monuments of Indian antiquity. They consist of fortified camps, barrows for the dead, images and utensils, military appointments, &c. A fortified camp (which is a fortification of a very complete nature, on whose ramparts timbers of 5 feet in diameter now grows) commands the town of Brownsville, which undoubtedly was once an Indian settlement. This camp contains about 13 acres, inclosed in a circle, the elevation of which is 7 feet above the adjoining ground. Within the circle a pentagon is accurately described, having its sides 4 feet high and its angles uniformly 3 feet from the circumference of the circle, thus leaving an unbroken communication all round. Each side of the pentagon has a postern opening into the passage between it and the circle, but the circle itself has only one grand gateway, which directly faces the town. Exactly in the center stands a mound, about 30 feet high, hitherto considered as a repository for the dead, and which any correct observer can perceive to have been a lookout. I confess that I examined these remains of the former power of man with much care and veneration; nor could I resist reproaching those writers who have ignorantly asserted, 'We know of no such thing existing as an Indian monument of respectability, for we would not honor with that name arrow-points, stone hatchets, stone pipes, half-shapen images, &c.'

"The one which I have opened might have been originally a parallelogram 60 feet by 20, and 30 feet high, whose upper surface and angles have been rounded by the long influence of time and accident; for we are not to conceive that the form of ancient works is exactly similar to that which they first possessed. Such, indeed, as are built of stone and have not been exposed to dilapidation do not experience any material change; but all those monuments (and they are by far the most numerous) which are composed of earth must have undergone considerable alteration and waste, and therefore afford a very scanty evidence of their original dimensions, or (except where bones are found) of their purpose. The bones in the barrows of this neighborhood were directed to every point, without regard to system or order. This surprised me more as I am well convinced that in general most of the ancient aboriginal nations and tribes had favorite positions for their dead, and even favorite strata with which to cover them, as I shall have occasion to explain when on the spot where the primitive Indians resided. Perhaps the irregularities in the barrows of this place may arise from the bones deposited in them, having been those of persons killed in battle, and collected by the survivors in order to be buried under one great mound. - - - At the same time and place I found in my researches a few carved stone pipes and hatchets, flints for arrows, and pieces of earthenware. I cannot take upon me to say that the workmanship of any of these articles surpasses the efforts of some of the present race of Indians, but it certainly destroys an opinion which prevailed, that the inhabitants in the most remote times had the use of arms, utensils and instruments made of copper, iron, and steel."

Josiah Priest, in his American Antiquities, 1833, p. 85, mentions this ancient fort, but he uses the language of Ashe without giving credit. Mr. James L. Bowman, who had frequently seen the outlines of the camp, notices it briefly in "Day's Historical Collections" and the "American Pioneer."

Curiously carved rocks are to be seen on many parts of the Monongahela River. At the mouth of Ten-Mile Creek, 12 miles above Brownsville, are the most interesting of these. Some of the rocks there bear the impress of a man's foot, a horse's foot, a hand, a head, a turkey, a fish, birds, beasts, &c.

On the farm of Mr. George. E. Hogg, near Dunlap's Creek Church, 5 miles east of Brownsville, there have been found a vast number of flat stones, soft and friable, which are full of small circular indentations of various diameters, as if made by the attrition of some harder substance, rubbed between the hands. Possibly they were used to produce fire by rubbing pieces of cane in them rapidly between the palms of the hand.

ROCK-CARVINGS ON THE SUSQUEHANNA RIVER.

By F. G. Galbraith, *of Bainbridge, Pa.*

The rock referred to in this paper was originally 71 feet in length and 10 feet in width. Seventeen feet on the west and 16 on the east remain undisturbed. The center, 38 feet in length, was blasted away many years ago, and the stone used in the construction of a shad-fishery, by which many carvings were undoubtedly destroyed, traces of which I discovered upon fragments of rock lying scattered over the upper end of the island. The rock was evidently a continued mass of sculpturing, and hundreds of these may yet be traced with a little care. A large portion of the east end is becoming detached from the main body, and will in the course of a few years topple over, face foremost, into the river. Many of the carvings, which are undoubtedly of a very remote date, are much defaced by the elements. This statement relates more particularly to those on the north and east ends, which I impute to the changing in the course of the stream at this particular point. The rock being located at the head of Grey Rock Falls, is subject to much wear by swift water. For this reason, and the fact that the rock is composed of talcose slate, it is my impression that the carvings were originally deeply cut, which evidence can again be traced in the east and south end carvings, all of which are much deeper than those on any other portion of the rock. The large circular carving is the only one traceable by compass on the rocks, and faces "nine o'clock, sunrise." The tracings were all taken by actual measurements from dead-lines made upon the rock, one perpendicular through the center of the carving and another across. The one from which the tracings were made is slightly enlarged to show it more plainly. The small island (a fishery) which it connects is probably 80 feet long by 20 broad at its widest point. The large rock on the opposite side of the middle channel is about 150 yards distant, having several carvings upon it. I am unable to say whether the spring and fall floods rise sufficiently high to cover the large projecting rocks below the small island so as to change the course of the stream at that point, but do not think so, as the fall of water is about 8 feet to the mile. Mr. French informed me, however, that the rock and island were accessible in very dry seasons, so that it does not appear necessary that boats should have been brought into requisition by the natives, or if so, only in case of high water, while at work upon the rock. The outer rock can only be reached by boat.

CHAUTAUQUA COUNTY, NEW YORK.

By James Sheward, *of Dunkirk, N. Y.*

Chautauqua County has furnished many indications of a former occupancy; but, as yet, we have found nothing to establish its probable antiquity.

I have some fragments of a piece of pottery, a jar or vase, found beneath the roots of a very old apple-tree in the town of Stockton. This tree grew in a valley, and was evidently quite old when it was blown down. The vase or jar was broken, but it was estimated, from the pieces found, to be about two gallons capacity. The pieces indicate that it was made principally from pounded quartz. The surface was smooth and impervious to water. The depth at which it was found I have been unable to ascertain with any certainty. Thus far I can find no evidence of a secular increase in the valley; consequently there are no data for a calculation of the period when the jar was abandoned. The fragments and description were given to me by Mr. F. McCullough, of Delanti, this county. Within the village of Frewsbury, town of Carroll, some years ago, a pine stump, which had been left standing for a long time, was pulled up, and under its roots were found two human skeletons. I saw some of the bones were parts of the skull, but was unable to determine whether the crania indicated round, flat, or oval-shaped heads. I could obtain no certain information as to the depth below the surface at which these bones were found, and none as to secular increase. The pine stump was very large and showed 580 cuticle layers or growths. The tree at the time it was felled was five hundred and eighty years old, and was probably cut down twenty years or more before the stump was pulled up. A period of six hundred years must have elapsed since that tree began to grow. How long those skeletons have been inhumed prior to the germination of the tree we cannot tell. At the first settlement of that section of our county the valley was a vast pine forest. Through this valley runs a creek or brook, tributary to the Conawauga, one of the tributaries of the Ohio. I have reason to think that a thorough exploration of this neighborhood would give valuable information.

In the town of Sheridan, on the farm of Mr. N. Gould, have been found, at various times, numbers of human bones. These bones indicated, by their number, size, and position, that the place where they were found was either a cemetery or had been the scene of a battle where large numbers of all ages and sexes had been killed. The craniological developments I know nothing about. In the vicinity of Mr. Gould's farm are yet to be found earthen fortifications, breastworks, and ditches. These fortifications are somewhat numerous and extensive, reaching over into the town of Perufret, where a hill, known now as Fort Hill, gives unequivocal testimony of the work of man. Between Fort Hill and Mr. Gould's farm is found a hill about 30 feet high, with a circumference at its base of about 90 paces. The top of this hill is flat, oval in outline, and composed, as far as examined, of the material constituting the surface formation of the plain. The hill may possibly have been formed by currents of water, but there is no bluff or bank near it. It stands about 3 miles inland from the lake, and was originally covered with large forest trees in nowise differing from the trees of the surrounding plain. Mr. Gould, over seventy years of age, says he well remembers the hill as it was in his childhood, and that it was so conspicuously above the surrounding trees as to be regarded as a landmark by early navigators of Lake Erie. He describes one tree, which grew near the top of the hill, as being 4 feet in diameter. Careful examination of the plain gave no depression in the surface to indicate that the earth which composes the hill was excavated there. I am inclined to the opinion that the hill is in reality a mound, and that it was in some way connected with the other fortifications already mentioned. In this connection I may mention that some years ago, in plowing a field on his farm, Mr. Williams, of the town of Sheridan, turned up as much as two bushels of flint spalls or chips, and a number of arrow and spear heads. These were pretty much all together, and led Mr. Williams to suppose that Indians made their tools there. Some of these implements, in outline and material, very nearly, if not entirely, correspond to those found in Ohio, near what is called Flint Ridge. I believe that flint or chert is not to be found in this county. Whether the crude stone was brought to the place where the flints were found, and was there worked into shape, cannot be settled as yet. Some fifty-odd years ago I saw a large field in what is now the city of Zanesville, Ohio, plowed up for the first time. The whole field was dotted over with flakes, spalls, arrow and spear heads, stone hammers, and axes, indicative of a manufactory. Old and partly decayed stumps were overturned or pulled up and the spalls were found under them. From this field to Flint Ridge there was nearly a continuous water communication. There are grounds for believing that the material was originally quarried at Flint Ridge, where numerous excavations, partially filled up, are to be found, and having trees growing in them. Whether the persons or people who wrought in Sheridan were located there we do not know, neither can we safely say that the implements found were made by those who erected the fortifications.

I have an amulet which was plowed up on the farm of Mr. Prendergast, in the town of Westfield, this county, and by him presented to me. It somewhat resembles Fig. 27 in Colonel Foster's work, "Prehistoric Races," page 222, which he calls a *totem*. His totem was found in Wisconsin; the amulet was found in Chautauqua County. I will give my reasons for regarding these effigies as amulets in an article now preparing, entitled "An Inquiry into the Origin and Antiquity of the Indian Race." I have never yet found an Indian drawing or signature of his totem that could be at all compared to the outline of the amulet; and as there are two holes neatly drilled and rimmed for the reception of a thong or cord, I am inclined to think that no *Indian* made it, and that it belonged to a people of superior taste and skill. He who made and polished it was an expert workman, and could not have been a hunter or a warrior of the Indian kind. I have a stone gouge of admirable construction, which was plowed up in the town of Sheridan and given to me by Mr. Griswold. Like the amulet, it must have been made by an expert. The stone is hard enough to carry quite a fine edge, and the tool gives evidence of having been much used on wood. It is supposed that it was used for tapping the maple tree. I have some other implements found in this county, one in the shape of a celt, which, a Seneca Indian told me, was used by his people for skinning animals.

Chautauqua Lake lies within this county, and many relics have been found along its shores. At one place Long Point juts out into the lake, forming a long, narrow neck of land, which used to be fringed with bushes and covered with stately trees. On this point, near its outer extremity, there had been a canal and basin excavated. A party or a person could easily double the point in a canoe, part the bushes and paddle through the canal and into the basin, where they were perfectly hidden from view. I saw the remains of this canal and basin about seventeen years ago; the outlines were then quite distinct. These works, however, are not proofs of a settled population.

The Iroquois knew all about our territory; indeed, they gave the name to the lake, Cha-tau-quah, or "bag tied in the middle." In a written speech, prepared by *Corn-planter*, *Half-town*, and *Big tree*, Seneca chiefs or sachems, and presented to President Washington, they ask their "father" if he is determined to crush them, and say, in case he is: "In this case one chief has said he would ask you to put him out of his pain. Another, who will not think of dying by the hand of his father or his brother, has said he will retire to the Chataughqua, eat of the fatal root, and sleep with his fathers in peace." This speech was answered by the President, and these chiefs replied as follows: "Father, we see that you ought to have the camping-place from Lake Erie to Niagara, as it was marked down at Fort Stanwix, and we are willing it shall remain to be yours. And if you desire to reserve a passage through the Canawauga, and through the Chataughquah (Lake), and land for a path from that to Lake Erie, take it where you like best. Our nation will rejoice to see it an open path for you and your children while the land and water remain, but let us pass along the same and continue to take fish in those waters in common with you."

There was, at an early day, a path or road from Lake Erie through the towns of Portland and Chautauqua to Chautauqua Lake, and thence to Pittsburgh, which the French and Indians traveled; but, except a rude camp and defenses, there was no settlement nearer than Logstown, Ohio. The Senecas formed what was called the western door of the Iroquois Long-house, and claimed our county as a part of their hunting-ground. I can find no satisfactory proof of the occupancy of this territory by any tribe of Indians, unless it may have been the residence of the Kah Kwahs, a tribe said to have been driven out by the Iroquois, and which has wholly disappeared. It is claimed by some that there was once a tribe called Alleghans occupying lands in or near this county.

It appears to me that the Iroquois, admitted to be the most intelligent and powerful of all the tribes or confederacies, were never far enough advanced to construct the fortifications or to make the polished stone implements found in our county; and if they were not, was there any other people who were ever settled in this territory?

Champlain, in 1609, gives us some idea of the barbarism of the Senecas, against whom he made war. Wassenäer, the Dutch historian, in 1621-'2 represents the Indians as savages who could not have been of the "polished stone age." Cartier found them "insufferable"; so Cadillac describes them. All we can gather from historical documents leads to the belief that the stone implements, the pottery, the fortifications, the skeletons found, and the large mound (if it be one) were the work of a people existing anterior to the historic period and more advanced than the Knoshioni, or Powhatanic stocks. One argument grows out of the fact that all the relics have been dug or plowed up. Stone axes, flint or chert arrow and spear heads have often been found on the surface or just below the surface of the land, while the pottery, gouge, amulet, &c., have been found at various depths. The two skeletons found at Frewsbury under the pine stump lived and died long before the "League of the Long-house" was formed. Two feet, at least, of a secular increase has grown up since these two human beings were laid away. Can we, in the absence of "monuments of known age," ever ascertain the rate of that increase? The lofty old pine tree began its life more than six hundred years ago. How long before that tree sprouted had these bodies been deposited there? And then, again, were these two dead ones members of the tribe or nation that raised the breastworks and made the implements we find at various depths below the surface of to-day?

In my search after data upon or from which to estimate a secular increase of land I have consulted many Indians and whites, but none are able to give any facts. Sa-gun-da-wie, or Big Nose, a member of the Seneca tribe, gave me an iron ax or hatchet, evidently one of the kind used by the Dutch or French to trade for furs. He told me it was plowed up on the Cattaraugus reservation from a depth of about 8 inches, but he could not say whether the plow had ever before passed over the spot. The ax must have been lost or thrown away at least two hundred years ago; it may have been two hundred and fifty years. If we were sure that the implement was left on the surface two hundred years ago, the secular increase would have been at the rate of about 4 inches per century; if two hundred and fifty years had passed, it would have been at the rate of 3½ inches per century, or nearly the same as that found by Dr. Horner at Heliopolis, in Egypt. If we assume an average secular increase in our valleys of 3 inches per century, the skeletons at Frewsbury are at least eight hundred years old; they must be at least six hundred years old. I am not without hope that closer and more patient observations will, in course of time give us some reliable data upon or from which we can estimate antiquities now seemingly beyond our reach.

That Chautauqua County was once inhabited by a people more advanced than were the Indians found in the neighborhood by the French and Dutch may, I think, be assumed. That there were human beings here eight hundred or even one thousand years ago seems probable.

I think there are many reasons for the belief that the Indian race, or races, if you will, were the descendants of the Mound-Builders, notwithstanding eminent ethnologists think to the contrary.

I think our county would richly repay a thorough scientific exploration.

ANTIQUITIES OF ONONDAGA AND ADJOINING COUNTIES IN NEW YORK.

By W. M. Beauchamp.

The best accounts of the antiquities of this portion of New York are in Clark's History of Onondaga (1849). This work treats principally of Elbridge and Pompey. General J. A. Clark, of Auburn, has published an identification of Onondaga historical sites, which is also worthy of study. Recently the Skaneateles Democrat gave an account of the finding of a clay pipe there, with human face, 30 inches under ground, in low land; the Auburn papers, of the discovery of human skeletons in Fleming; and the Syracuse papers, of the disinterring of thirty prehistoric skeletons in stone cists in East Syracuse, and of the finding of several skeletons (historic) in Onondaga Valley.

The writer has also made extensive investigations in this section, correcting some errors, and gives, in the following notes, the results of his labors and reading. The localities mentioned will be found on the accompanying chart.

OSWEGO COUNTY.

At Fulton, on the east side of the Oswego River, were the remains of a European earthwork, constructed in the French war, and of a semicircular aboriginal fort. The other portions were removed in making the canal. Here was a noted portage. Bone Hill, now leveled, on the west side of the river, contained large quantities of human bones, and about Lake Neawantha were many arrows.

1. On the line dividing the towns of Volney and Schroeppel was an

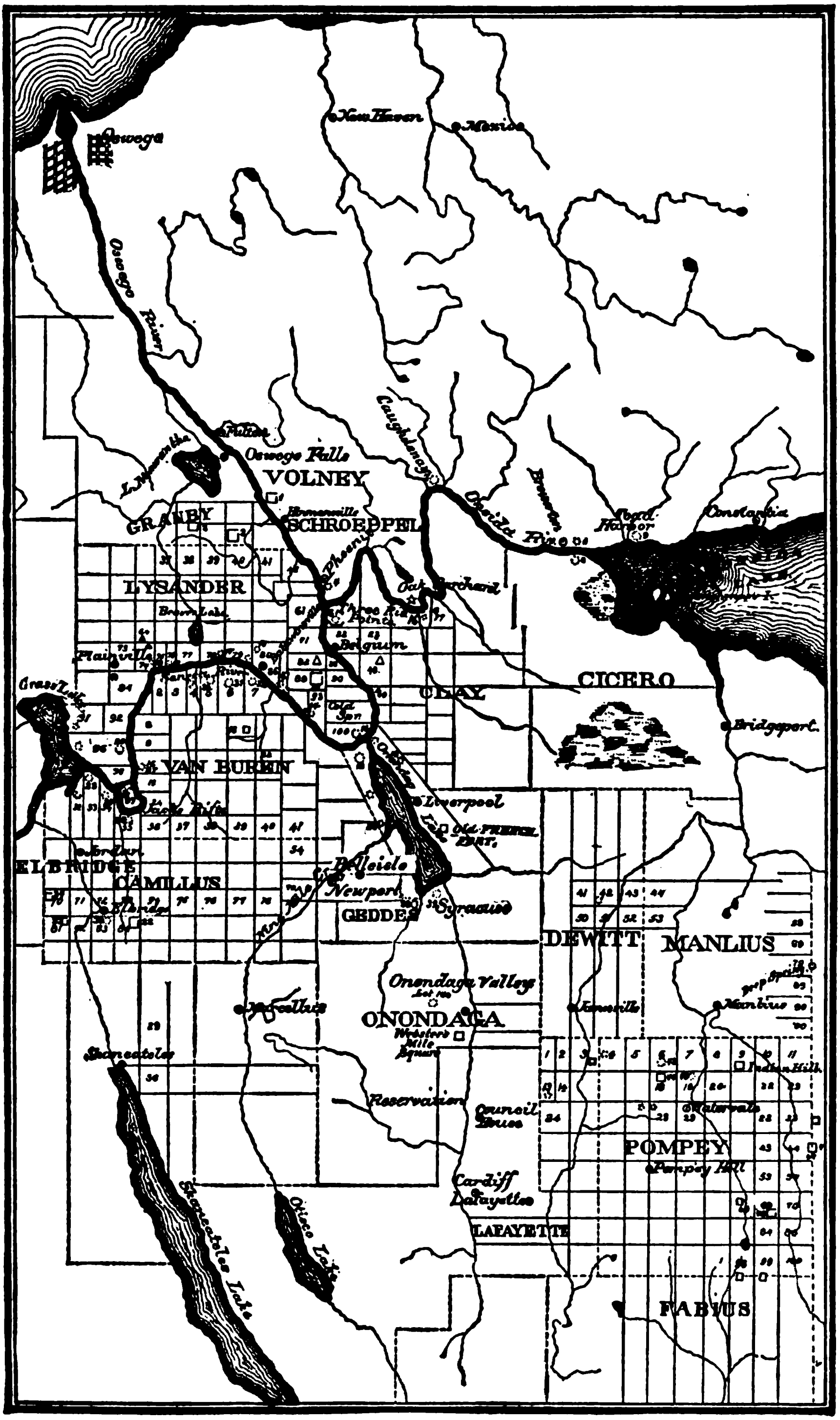

Oswego
New Haven
Mexico
Oswego River
Fulton
Oswego Falls
Caughdenoy
Oneida River
Brewerton
Constantia
Cicero
VOLNEY
Hannensville
GRANBY
SCHROEPPEL
LYSANDER
Phoenix
Oak Orchard
Brown Lake
Three River Point
Belgium
Plainville
Seneca River
Cold Spr.
CLAY
CICERO
Bridgeport
Cross Lake
VAN BUREN
Jacks Rifts
Onondaga Lake
Liverpool
Old French Fort
Jordan
ELBRIDGE
CAMILLUS
Belleisle
Newport
Syracuse
Elbridge
GEDDES
DEWITT
MANLIUS
Onondaga Valley
Lot 100
Marcellus
ONONDAGA
Webster's Mile Square
Jamesville
Manlius
Indian Hill
Skaneateles
Reservation
Council House
Cazenovia
POMPEY
Pompey Hill
Cardiff
Lafayette
LAFAYETTE
Skaneateles Lake
Otisco Lake
FABIUS

FIG. 1.

earthwork on a hill, now destroyed. A long wall, separating the hill from a marsh on the east, still remains. Arrow-heads of flint, *en caché*, have been plowed up.

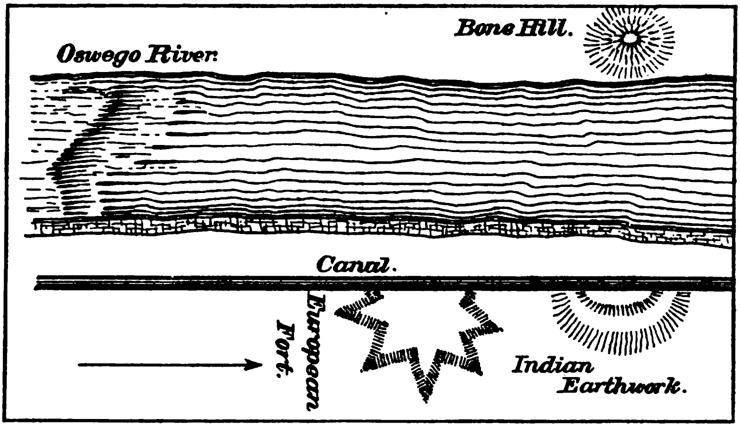


FIG. 2.

2. The remains of a circular earthwork on Mr. J. T. Geer's farm, lot 24, Granby, east of the railroad station, are in very good preservation,

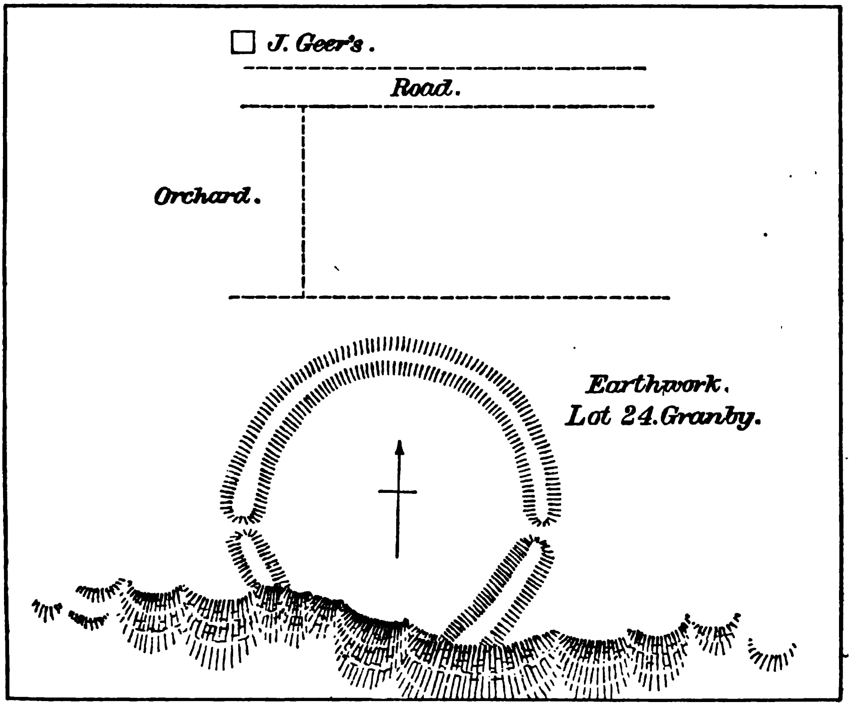


FIG. 3.

showing both gates. It yields nothing but small pieces of earthenware. The area inclosed is about an acre, and is upon a hill; Clark's estimates for this and the next are too high.

3. There was an earthwork, like the preceding, on lot 32, east of the State road, but it has been demolished by cultivation. It was on a large plain, and many fragments of pottery, celts, and clay pipes are found.

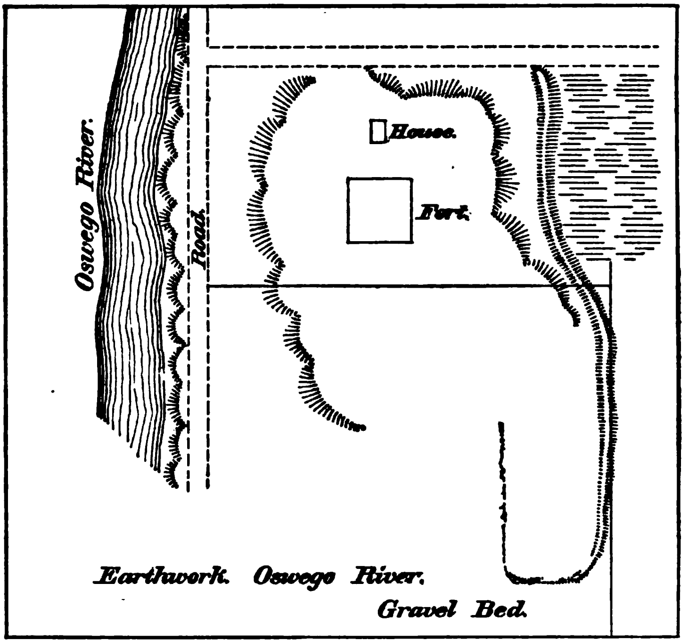


FIG. 4.

4. There were villages about Phœnix of historic and prehistoric dates. One of the most important was on a small island, where over 1,500 flint implements have been collected; scrapers, flint and quartz arrows and knives, polished slate arrows, points, celts, gorgets, and bird totems abound.

7. A village site and cemetery occur at Caughdenoy, on the Oneida River. Arrows, gouges, and fine celts have been found.

8. At Brewerton are several village sites on either side of the Oneida River, near the lake. A noted burial-place is on the north side. These villages were both historic and prehistoric, and here the walls of old Fort Brewerton are still in good preservation. Arrows, pipes, celts, gorgets, and bird totems are met with here, and between this site and Caughdenoy two fine bayonet-shaped implements of slate were discovered.

9. On the Oneida Lake, at Good Harbor, fine arrow-points, stone tubes, and gouges have been found, and there are other localities beyond.

CAYUGA COUNTY.

52. In Brutus is the site of an earthwork, near the Seneca River, described by Squier. Fine gouges, with and without grooved backs, gorgets, arrows, and celts occur.

53. Remains of an earthwork, figured by Schoolcraft, are still to be seen on Fort Hill, Auburn. The pipes found here are peculiar. Two other sites have been identified in Auburn, and there were Cayuga settlements on Cayuga Lake, Salmon Creek, and Seneca River, mostly of the historic period. A well-known site is on Frontenac Island. Skeletons were dug up in Fleming in 1878. West of Cross Lake are sites but partially examined, and yielding coarse implements. Early sites have been found in the southern part of the county.

MADISON COUNTY.

The Tuscarora village of Conaseraga was in this county, as well as some Oneida hamlets and villages. There is said to have been an earthwork at Cazenovia, and there are burial-places near there. The most noted site is at Nichols Pond, on the Mile strip, which is claimed as the stockade attacked by Champlain in 1615. It is a few miles northeast of Cazenovia, and presents strong points of agreement and disagreement with Champlain's picture. It is prehistoric and yields fine relics. There was a fishing village at Bridgeport, and other sites will be mentioned in connection with Pompey.

ONONDAGA COUNTY.

Town of Clay.—On lot 14, near the Seneca River, was a small village and burial-place; and also on lot 16, at Oak Orchard, skeletons, tablets, arrows, pestles, celts, &c., have been found. A fine slate "bird-pipe" was picked up here in 1878; also slate arrows on lot 48, and a sandstone tube on lot 49. A fine copper celt, weighing 2 pounds 14 ounces, was recently found on lot 22.

Town of Lysander.—Near Belgium, on lot 82, a fine banner-stone was discovered, and also a fine and curious copper celt in 1878.

11. A village site exists at Cold Spring, lot 100. Human remains, celts, banner-stones, flint and quartz arrows are most frequent here. A bird totem, unique in form and material, has also been found on this spot.

10. On lot 89 was an earthwork, inclosing about 2 acres, within two circular ditches. Something like a wall was between these. It was on high ground, and the relics are earthenware, celts, pipes, and slender arrows of flint.

Two small hamlets were on lots 93 and 94, with similar relics, but coarser arrows; and two others occur on lots 86 and 87 (15), near Float Bridge and Railroad Bridge.

16. At Baldwinsville are vestiges of three small hamlets on the north side of the river, one of some size. The relics do not differ from those on neighboring sites.

17. A village site of two acres, probably once stockaded, occurs on high ground on lot 78. The arrows are slender and pottery fine.

18. A village site of two acres is on lot 76, where fine drills, celts, arrows, &c., are found, with banner-stones.

19. Here are three hamlets, with the ordinary relics, on lot 75, and there are others on lot 74. On this lot also was found a fine copper spear-head, and another was obtained on lot 64.

20. A village site remains on lot 96, where arrow-heads, celts, and a little pottery are found. This is on the Seneca River, and smaller ones occur at Cross Lake.

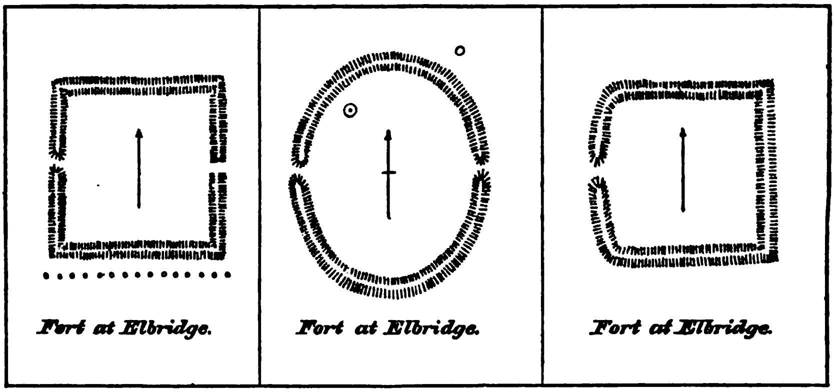
21. On lot 99 are two or three hamlets, revealing arrow-heads, hammer-stones, pestles, gouges, and celts. On the same lot was recently found a fine and very sharp copper celt. There are some smaller sites not mentioned here.

Town of Elbridge.—Small sites occur on the shore of Cross Lake, on lots 31, 32, and 33, with the ordinary relics.

23. Lot 34 contains the remains of a large village and one or two smaller hamlets, where arrow-heads, pestles and mortars, celts, fine gouges, and a little pottery have been found.

25. Lot 35 has similar remains on several sites, one historic. Stone pipes are found here in graves, and in a recent burial-place a fine human-headed pipe was unearthed. West of Carpenter's Brook one of the rare pentagonal arrows was found by the writer.

34. On a high hill on lot 70 was an earthwork, which Clark describes as rectangular, with two gateways, and inclosing 4½ acres. It really was elliptical, and inclosed a smaller area. Pottery is abundant there yet.



Fort at Elbridge. *Fort at Elbridge.* *Fort at Elbridge.*

FIG. 5.

35. A smaller one on a hill on lot 81 inclosed 1¼ acres. It is described by Clark as having straight walls on three sides and a curved wall on the fourth. It was probably also elliptical, but has been leveled.

36. On lot 83 was a large Indian village. The writer has ascertained that Clark was mistaken in saying that hundreds of grooved axes were found there. None were found, and they are very rare in Onondaga County.

37. Here was a circular fort on lot 73, inclosing about an acre.

22. On lot 84 was a circular earthwork, with two gateways, and said by Clark to have included three acres, but his estimates prove almost always too high. Earthenware always occurs in earthworks or stockades, and often river shells in the north part of the county.

Town of Van Buren.—26. An Indian orchard was located on lot 18.

27. Here was a small hamlet, on lot 16, with pottery, arrow-heads, and a pick-shaped banner-stone.

28. In the river, at lot 3, is a stone fish-weir in good preservation, with several bays, and formed of bowlders. Since the river has been dammed it has been generally some feet below the surface, but an unusual drought gave opportunity for full examination. There are others on the river, the Indians reserving the right to make them in their treaties.

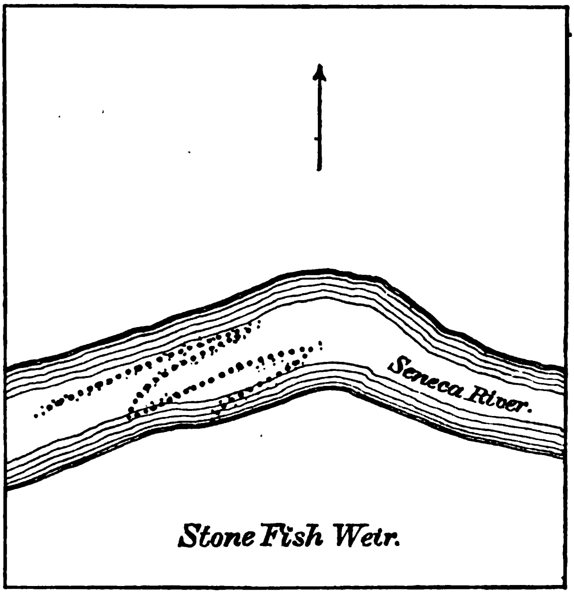


FIG. 6.

29. An Indian orchard and burial-place were located here, one of the few recent sites.

On lot 4, west side of Dead Creek, was a hamlet.

30. On lot 8, east side of the same creek, was a hamlet of considerable size, and there are fire-places on the opposite bank of the river. The Van Buren site yields celts, arrows, pestles, and pottery.

31. On high land, on lot 6, there is a large village site which was stockaded. Arrow-heads, celts, fine clay pipes, pottery, and one copper bead have been recovered. Close by was found a fine copper spear-head of large size.

32. Lot 7 includes at least four distinct village sites in Baldwinsville, south of the river, all of considerable size. On one was found a pentagonal arrow-head; on another a clay face luted on pottery. Here are burial-places and a great variety of prehistoric relics, including some fine pipes. At one point glass beads have been found.

33. A stockade, inclosing two acres, stood on a low hill on lot 13, by a small stream, and having one gateway. The usual prehistoric relics occur, with both stone and clay pipes. Near Memphis, lot 37, many fine articles have been found, as tubes, bird totems, slate knives, &c. Further east, on the Seneca River, are occasional small sites.

Town of Geddes.—12. On lot 9, west side of Onondaga outlet, are two village sites, on which occur celts, banner-stones, pestles, arrow-heads, scrapers, drills, stone pipes, plummets, gouges, together with a little pottery. Another small hamlet was east of the present outlet, and a burial-place in a gravel-bank, now removed. In the woods a little north is a small mound.

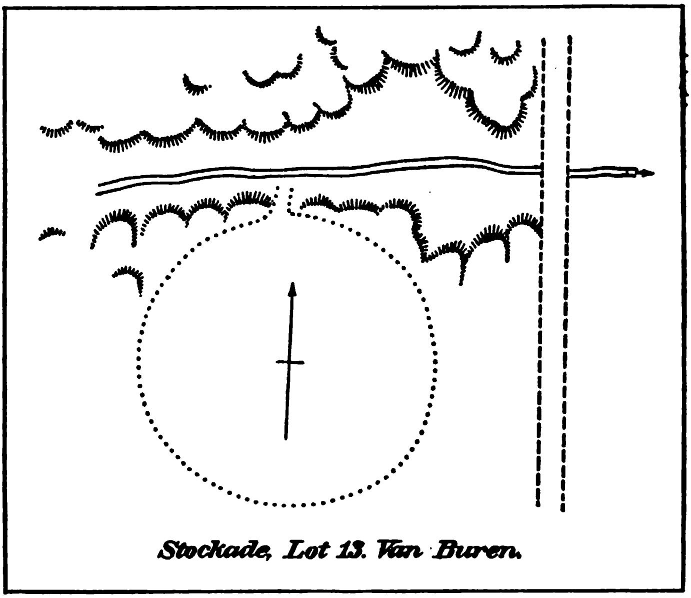


FIG. 7.

38. There is a village site on the north side of Nine-Mile Creek, with arrows and pottery, and there are others still further north, with fine relics. On one of these, by the shore, the writer obtained a small cup-shaped stone pendant of very rare occurrence, the only one in the Smithsonian collection having come from California.

The site of the ancient Kaneenda, a fishing village of A. D. 1700, was on the west bank of Onondaga Creek. Relics modern, but fine.

39. *Town of Salina.*—A scattering village stood on lots 61, 62, and 65. Pottery, banner-stones, pestles, and arrow-heads are found, and other remains occur near Liverpool, where was also a village. Bird totems have also been found in this town.

Fort of 1696.

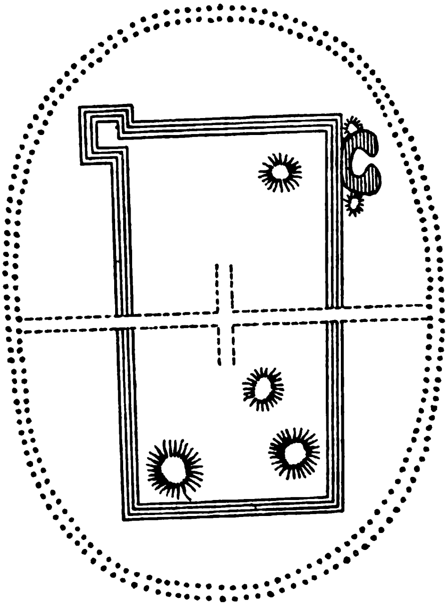


FIG. 8.

The old French fort of 1696 stood on lot 106, but traces of it can now be found only by digging. An Indian village grew up about it, and there was a burial-ground farther south. In Syracuse there were also orchards and burial-places.

Town of Onondaga.—Sir William Johnson built the Onondagas a stockade in 1756, which was burned in 1779. It stood on a plateau on Webster's Mile Square, and the inclined roadway by which it was reached from the creek yet remains. The writer recently examined and fully described this site. The several burial-places and other sites in this town are all modern, and yield European and Indian relics. Yet a stone plummet and a bird totem were found at the present reservation, the latter worn as an ornament by an Indian girl.

40. *Town of De Witt.*—A burial-place was discovered in East Syracuse, lot 42, in 1878, from which many skeletons were taken. They were inclosed in rude stone cists, which yielded also clay pipes, arrow-heads, and celts. Near Jamesville fine stone pipes have been found.

41. *Town of La Fayette.*—On lot 3, east side of the reservoir, is the site of the large fort destroyed in 1696, during Frontenac's invasion. It was a stockade and earthwork, and the remains are both Indian and European. Several burial-places occur in this vicinity.

42. On lot 13 was a large Indian orchard and a settlement, which was abandoned on the invasion of 1779. The relics are both Indian and European. A burial-place has the graves in rows, and also scattered promiscuously. The bodies were inclosed in boxes of wood or bark. (*Clark.*)

Town of Pompey.—This has many sites, nearly all historic, and fully described by Clark, but with some errors.

43. At this point is a village site, which had circular lines of stone and relics of mixed origin. (*Clark.*)

44. A little south of the last named is a burial-place, and also lines of earthworks, with similar remains. (*Clark.*)

45. On lot 19 was a village site with four streets and mixed relics. (*Clark.*)

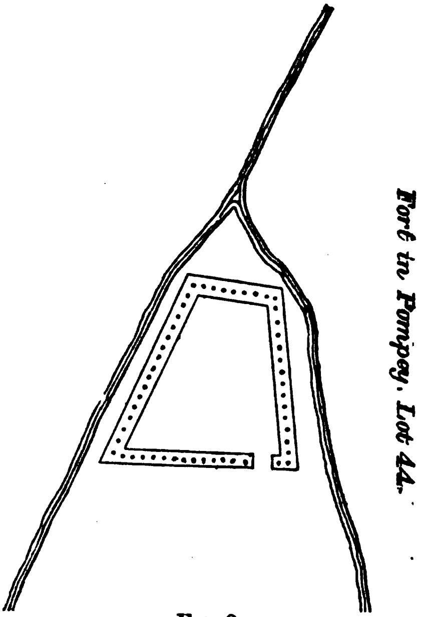


FIG. 9.

46. On lot 9 is Indian Hill, probably the Onondaga Castle of 1650. Clark describes the settlement as about a mile long, with a burial-place of 30 acres, but makes an overestimate again. He describes the earthwork as elliptical. European relics are found there yet. It may extend slightly into lot 20.

47. East of lot 44 was an angular earthwork and stockade, inclosing five acres, with a burial-place. (*Clark.*) The plan given by Clark would seem to be reversed by present indications. This is a prehistoric site, and has yielded very fine articles; among the rest, a clay pipe with 14 human faces, and earthenware with faces luted on at the corners. On lot 68 there is a site of about 3 acres.

48. The site on lot 69 is described by Clark as similar to No. 47, but it is on higher land and has some European relics.

50. On lot 100 is a ditch with a stockade inclosing 8 acres, with graves within and without. The bodies were placed in rows, which face the east and west alternately. (*Clark.*) A historic site, judged by relics. The post-holes and graves can yet be seen.

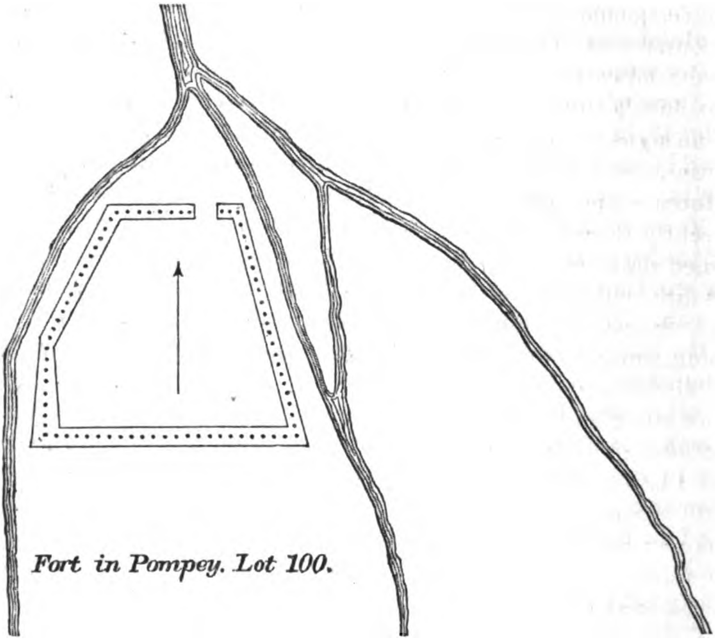


FIG. 10.

49. On lot 99, and like the last (*Clark*), graves are yet distinct.

On lot 98, touching the town line of Fabius, is another circular site on a hill-top, and of early date, though the writer discovered European articles mixed with the peculiar pottery. This is not mentioned by Clark.

54. This was "Indian Fort." An earthwork on lot 33, inclosing ten acres, with a straight ditch across the point, the flanks being defended by steep banks of the ravine. Pottery and early Indian relics abound, but with some European articles. (*Clark.*) Some have supposed this was occupied by the Onondagas just before they moved to Indian Hill. Through this town and on the Seneca and Oswego Rivers brass and iron arrow-heads are sometimes found, of European origin, occasionally perforated, and of the same pattern as those found with the "Skeletons in Armor" at Fall River.

Town of Manlius.—The deep spring on lot 79 was the eastern door of the Onondagas, and shows signs of their occupancy. It was the starting-point for surveys. There is a reputed earthwork in the west part of this town, but of doubtful character.

GENERAL REMARKS.

Some banner-stones of striped slate have been found in Camillus, and one on Skaneateles Lake. Arrow and spear heads are occasionally found in all parts of the country.

The settlements in Southeastern Onondaga show a large and general intercourse with the whites; those in the northern part but very little, the only indications there being the Indian orchards, a few brass kettles at Jack's Rifts, and a few glass beads at Baldwinsville. Many sites have no signs of vessels of any kind. Potstone vessels occur in several localities, but seldom in connection with earthenware. Banner-stones, bird totems, and gorgets of striped slate occur in many places, some apparently recent. Catlinite is found at Phœnix and Onondaga Lake. Polished slate arrows are found on all the rivers, but sparingly. Stone tubes are generally of striped slate, and of many forms, while pipes have their usual variety of form and material. Copper articles are not common, but are generally fine. Stone cups take many shapes, a handsome circular one of striped slate from Hannibal being the finest. Banner-stone and gorgets vary greatly in form and material. Plummets are often highly finished, and some of the finest drills have been discovered here. Arrows and spears are of all materials and finish. Sinkers and hammer-stones occur on most sites, and the latter exhibit a perplexing variety of forms. Many fine articles have been found on the great trail from the north crossing at Brewertown, and others near the east and west trails.

The Onondagas were partial to stockades, although they also had earthworks. None of the settlements seem very ancient, and the defensive works may be placed in four groups: Earthworks along the Seneca and Oswego Rivers, east and north of Baldwinsville; simple stockades about Baldwinsville; earthworks in Elbridge; earthworks and stockades combined in Pompey. The last two groups have features in common, but the others are distinct; they seem of different periods.

The pottery is of the ordinary Indian type, and some attempt has been made to compare sites by its styles of ornament. Celts are of both hard and soft stone, and pestles and mortars of common forms. Semi-circular slate knives are sometimes found, generally without a thickened back.

There are no large burial-places known near the Seneca River, but the bodies found are in a sitting posture, and corn frequently occurs in graves. Horn implements are found on the southern sites, seldom on the northern; and there are marked differences in arrows, spears, and earthenware.

A PERFORATED TABLET OF STONE FROM NEW YORK.

By William Wallace Tooker, *Sag Harbor, N. Y.*

In every considerable collection of aboriginal antiquities can be seen those thin, perforated tablets of stone, commonly called gorgets, twine-twisters, pendants, or whatever else the theory or fancy of different writers or collectors have bestowed upon them.*

These fanciful titles are mostly conjectures, for it is a recognized fact that no one yet knows the aboriginal use of these tablets with any degree of certainty.† Those with one to five perforations are all given the same name or put into the same class, without regard to the fact that those with more than two perforations of a recognized form were used for a different purpose and should be classed differently.

We do not call drills arrow-points, nor grooved axes celts, because they have the same kind of points or blades.

So it ought to be with the different forms of these perforated tablets. To those with one perforation perhaps belong the name of pendant, having been used for personal adornment, but as the greater number of those with two perforations bear no marks of having been worn suspended by a string, may be called twine-twisters or anything else that theory may invent but cannot prove. As the writer of this brief article does not care at present to theorize in regard to the uses of the tablets with one or two perforations we will leave those out of the subject and proceed to explain the object of this essay.

The tablets with four perforations similar to one already figured and described as a gorget by a well-known writer on this subject,‡ (who does not say whether the specimen bears any cord marks or not, probably not,) belong to another class, and were no doubt used for an entirely different purpose.

It is one of these tablets in my possession that I intend to describe and to prove, as I have already done to the satisfaction of all who have seen it, that it is neither a gorget, twine-twister, totem, or pendant, but something that I have never seen mentioned in any work bearing on the subject that has been accessible to me.

That something is nothing more nor less than a puzzle, a plaything made to amuse some young savage, or perhaps an older one, as we know they are easily amused.

This tablet, of which figures 1 and 2 show the obverse and reverse, is made of slate with the usual countersunk perforations common to all perforated tablets, and is marked on its edge with twenty-four tally or record marks. These have become nearly obliterated by time and weather. This tablet was found on Montauk Point, New York, and must have been in use for a long time to have caused the wear near the perforations, consequently have been the cherished property of its aboriginal owner.

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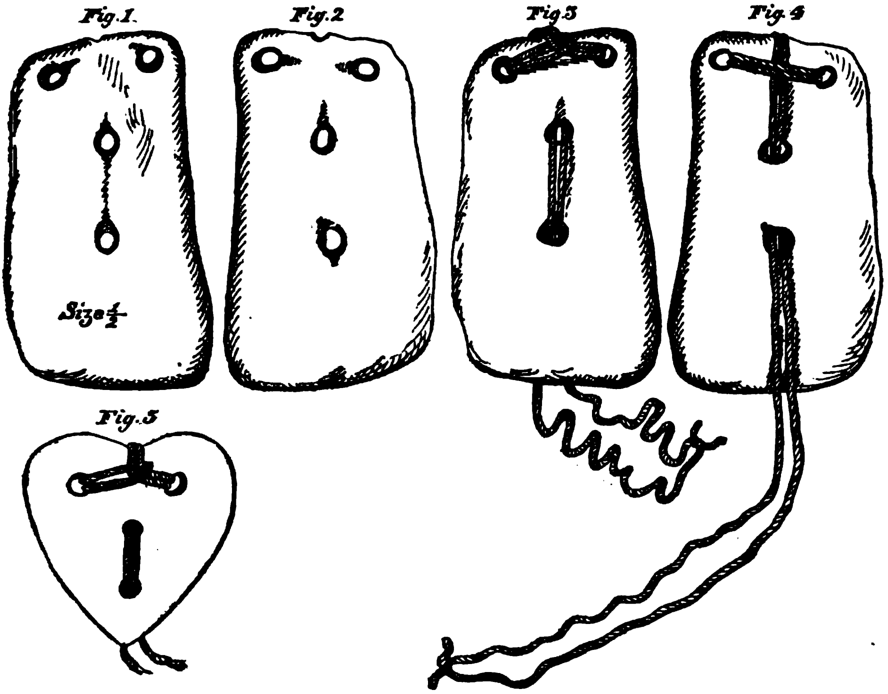
* Jones. Antiquities of the Southern Indians.

† Rau. Smithsonian Contributions, No. 287, 1876, page 33.

‡ Abbott. Primitive Industry, Fig. 361, 1881.

One can easily see the marks of where the cords have worn slight grooves or abrasions between the different perforations. This is where it differs from all the tablets with two perforations only that have come under my observation, as they as a rule never bear any marks of cords.*

This tablet, it will be noticed, bears on its upper margin a slight notch or groove, worn smooth as by the wearing of a cord. The abrasions on this tablet having been made by cords or sinews passing through the various perforations, the question naturally arises how were the cords put on to have caused the wear in those particular places, and why were they put on in that way? If it was a gorget or a pendant, why the necessity of so much cord traveling through the different perforations, which evidently belonged to it when in use; why so many perforations, when one loop and one perforation would have answered? This I consider as a proof it was not a gorget, nor was it worn as an ornament.



Let me proceed and illustrate as simply as I can how this tablet was used and strung during the aboriginal era. Take a piece of cord thirty-six inches long or thereabouts, tie the two ends together, place it on the tablet, beginning at the top, forming a slip noose through the two top perforations, then following the direction of the abrasions with the tied end, we find the cord placed on the stone as in Figs. 3 and 4, which shows it better than any description could give. One slight abrasion above the third hole on Fig. 3 has not been covered by the cord; that place has been made no doubt by hanging up the tablet when not in use or by reversing the cord. This was evidently the way the string was placed on the stone originally, for in no other way could those abraded places in the tablet have been made.

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* Rau. Smithsonian Contributions, No. 287, 1876, page 33.

The puzzle part of this tablet is to get the string off, with some one holding fast the knotted end, then to put it on again with the end still fast.

The puzzle is solved by following the cords with the loop over the top down through the two lower perforations with plenty of slack; after getting through the perforations slip the loop over and clear around the tablet, then the loop will be found separated from the two strands, then the cord can be drawn from the tablet quite easily. In putting the cord on again the process is reversed, and consequently more difficult.

Fig. 5 represents an ivory heart-shape puzzle from China. The reader will see that the cord is put on in the same way, and that the perforations bear the same relation to each other as they do in the former illustrations.

In offering the above to the scrutiny of those who have made these objects of stone almost their life study, I wish to say that I know I am invading their domain to assert that these tablets with four perforations are puzzles. But I think I have made out a good case in favor of this tablet of mine, and hope the subject may be investigated still further, and that others of the same form and number of perforations may be extant that will show the cord marks as perfectly as mine does, and thus corroborate my assertion that this tablet of stone is a puzzle.

To the many contributions in regard to the problematic uses of these tablets I offer the above mite, trusting that it will solve partly the problem that has puzzled so many.

ANTIQUITIES OF EAST WINDSOR, CONNECTICUT.

By E. W. Ellsworth, of *East Windsor, Conn.*

There are no remains of aboriginal structures in this vicinity. The indications of a former occupation by the aborigines are scattered relics found in the soil. These relics are to be found anywhere, but are not remarkably abundant in any one locality. The most promising places for search are dry sand knolls, in the vicinity of some river, brook, or large spring.

The caving of the banks of the Connecticut River occasionally discloses a place of interment. The graves are not in groups, nor arranged according to any plan—sometimes in level loam soil, though sandy elevations seem to have been preferred.

Usually each grave contains the remains of one individual, though, in some cases, those of several have been found near each other. No burial posture is distinctly indicated. Bones, soft, crumbling, and broken, are found. The graves are not more than 3 feet deep. No evidence of artificial preservation of bodies exists, though there is a hint of cremation in the frequent occurrence of charcoal among the bones, which, however, are not plainly calcined.

Spear and arrow heads have been found cached. I have in my possession a find of fourteen flint arrow heads, averaging about two and a half inches in length, and most of them perfect. These heads were found at East Windsor Hill, on my father's farm, about 30 rods from Connecticut River, in a sand knoll, about two feet under ground, associated with a little charcoal and sooty sand. A fragment of a small and remarkably thin soapstone cup was found near them; nothing else. They came to light in consequence of the digging of a roadway through the knoll.

Another similar find was made this spring in this town (South Windsor), not far from the line of Connecticut Central Railroad, about midway between South Windsor and East Windsor Hill stations, near a brook, in low ground. The cache was opened in plowing, though the plowman did not notice it. Some boys afterward found flint spear heads among the furrows, and dug up the ground, and took out about one hundred heads, each between two and four inches in length, many whole, some broken. There was a scramble among the boys to procure them, and the collection was scattered beyond recovery before it came to the notice of any person interested to preserve it entire.

Arrow heads in unusual numbers are found on sand hills, brought to the surface by rains and winds; and in the same places it is common to find flat and sharp angular chips of flint and quartz, such as are not found in our sand elsewhere. These are suggestive of the manufacture of arrow and spear points at those localities.

Fragments of clay pottery are common; but there is nothing by which places of manufacture can be located.

Some items of value may be gleaned from the "Connecticut Historical Collections," published by John Warner Barber, New Haven and Hartford, 1836. For instance, "In the south part of the town" (East Windsor, now this town of South Windsor), "where Podunk River crosses the road to Hartford, was an Indian burying ground. A few years since a number of skeletons were discovered, by digging from one to four feet. These skeletons were found lying on one side, knees drawn up to the breast, arms folded, with their heads to the south. A covering of bark seems to have been laid over them, with some few remains of blankets; in one instance a small brass kettle and hatchet were found in good preservation, the remains of a gun barrel and lock, a number of glass bottles, one of which was found nearly half filled with some sort of liquid. These articles were probably obtained from the Dutch, either by present or by trade. There was also found a pair of shears, a pistol, lead pipes, strings of wampum, small brass rings, glass beads; a female skeleton with a brass comb; the hair was in a state of preservation wherever it came in contact with the comb. After the Podunks had removed from these parts they were known to have brought a dead child from toward Norwich and interred it in this burying place."

The Podunk Indians were of peaceable disposition, and we have no records of serious feuds between them and the white settlers. They (the Indians) suffered much from forays of the Mohawks, who roamed across the wilderness from the northwest.

Of scattered relics, quartz and flint arrow points are most frequently found here. These were probably in numerous instances lost by the Indians in hunting. Then we have stone axes, hoes, chisels, gouges, and pestles. A large proportion of the axes, hoes, chisels, gouges, and pestles are made of trap-rock, and many of them have had but very little artificial fashioning to adapt them to their uses.

There are localities in this State, one of which in New Britain, I have particularly examined, where trap-rock, broken from the face of a cliff by the atmospheric vicissitudes of centuries, has accumulated in a sloping pile at the foot of the cliff. This *débris* consists of elongated and angular fragments, some of which, untouched as they are by art, would, if found in our fields to-day, be mistaken for genuine Indian relics. Kettles excavated from lumps of soapstone are sometimes found. These are usually broken and portions missing. They are of rude oval form, with a capacity of from one to three gallons; they have short, projecting handles or lugs at the ends, and are without ornamental carving. The sides and bottoms are from half an inch to an inch in thickness, and are sometimes externally sooted, indicating that they were used in cooking.

Fragments of clay pottery are frequently found here, though it is rare to find a single piece large enough to show the size or shape of the vessel from which it was broken. Occasionally a sufficient number of pieces of one utensil are obtainable to admit of a reconstruction. One which I have in my possession was put together with glue and brick-dust, and some gaps were supplied with the same composition. It is now sound, strong, and perfect in appearance, and, for exhibition purposes, as good as if it had never been broken. This pot is egg-shaped, about fourteen and a half inches high and eleven inches in diameter, with a contraction in the rim below the mouth. The sides are about three-eighths of an inch thick. Similar pottery is always rudely ornamented on the outside by dots or lines, smooth or serrated, which were impressed by pointed implements when the clay was soft. Granules of quartz or mica were commonly mingled with the clay to prevent cracks in drying; and the ware was finished, without glaze, by burning in the same manner as modern bricks. In fact, it may be regarded as in substance soft brick of poor quality. One of these pots, recently obtained by Dr. Wood, was found in the bank of Connecticut River, in Massachusetts.* It was much broken, and has been clumsily reconstructed, but is nearly entire. The bottom is quite sharply conical, and the neck has no contraction, but slopes inward quite uniformly to the brim. The figure is somewhat that of a gigantic beet. Now, if we had given us a strap of leather, say 2 inches wide and 18 inches long, and were required to fasten it as a bail to this kettle, an obvious method would be to punch several small holes in the strap near its ends, and drill corresponding holes in the opposite sides of the neck and brim of the kettle and lace the strap thereto with a couple of strings. Whether this particular kettle ever had such a bail we cannot know, but there are the holes of suitable size and arrangement for the purpose. When I first saw them they struck me as an experimental attempt of the finder to sew or lace the broken parts together; but closer examination satisfied me that they had been drilled before the pot was baked, and while the clay was soft, with some tool like an arrow point. Subsequently I learned that the finder testified that the holes were in the sides of the neck when the kettle was found. There are no other drilled holes in the kettle besides these on opposite sides of the neck.

Breaks in Indian pottery sometimes seem to follow lines originally unsound, which gives a hint that the process of manufacture was not continuous, but that successive portions of the work were built up after previous ones had become firm by drying, from which there sometimes resulted an imperfect union between the wet clay and the dry.

About the year 1840 students of the Theological Institute, then located at East Windsor Hill, found on the bank of Connecticut River, at the west end of the institute grounds, a deposit of Indian relics. The place was a sandy knoll, above the highest water-mark of floods, and was traditionally known as "Gun's Hill," and as the site of an Indian fort. The articles then dug up consisted of fragments of large soapstone kettles, of the form previously described, axes, chisels, gouges, arrow-points, and other relics of stone. Referring to the Smithsonian work, No. 287, by Dr. Rau,† there was an article identical with figure 210; the only specimen of its kind that I have known to be found in this region. These relics were scattered among those who found them, and the sand hill has since been cut into by the river, beyond the place where they were found. I have, from that locality, a cup of soapstone that will hold about a pint; and an ancient musket bullet of large size. I have a copper chisel, like Fig. 226; length, 3 inches; width, 2; thickness, $\frac{3}{8}$;

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* West side, midway between Thompsonville and Springfield.

† "The Archæological collection of the U. S. National Museum."—*Smithsonian Contributions,* vol. xxii.

which was found by a laborer in the meadow directly west of my residence. I have not known of any similar relic found in this region.

I have several times visited the locality where was found that remarkable ancient implement of wood, which I described in the Smithsonian Report for 1876, p. 445. It lies so low that it is usually covered by the water of the river. I had a good view of it last September, but made no discoveries, and found nothing to modify the inferences set forth in the report. Undoubtedly the place was an ancient swamp, lower than the present average water level of Connecticut River. The soil was very wet with springs, some of them issuing from holes an inch in diameter. In seasons of low water many springs appear along the banks, most of which are ephemeral. The banks being previously filled with water, partly from the river and partly from the accumulations of rain, drain off in a low time.

A great deal of fine quicksand was issuing from the springs above mentioned, and I found more of this minute sand in the clay than I detected when it was in a frozen state. The natural color of the bed where untinged by vegetable material is very blue—quite different from the browns of the loam and sand now deposited by the river. The grooved log described in the report was unchanged. It inclines downward, as it enters the bank near the low-water line, and lies very firmly in place. Prying upon it with a lever ten or twelve feet long did not change its set in the least. I was deterred from attempting to dig it out by the certainty that the hole would immediately fill with water.

I visited the place again on the 18th of this month. The water was low, and appearances were not much changed. I traced the blue clay formation thirty or forty rods farther north than I had previously discovered it, and found it there containing much less vegetable material. Walking about twenty rods south of where I found the mallet, and near the water's edge, on a gently sloping beach of loamy sand, I noticed a portion of a buried stone, about two inches in length and half an inch in width. The pecked and rubbed surface looked familiar, and on being taken out it proved to be a pestle of gneiss 11½ inches long and 2 inches in diameter. It is round and smooth, well made, and perfect, with the exception of a small piece broken from the handle end.

SHELL HEAPS IN BARNSTABLE COUNTY, MASSACHUSETTS.

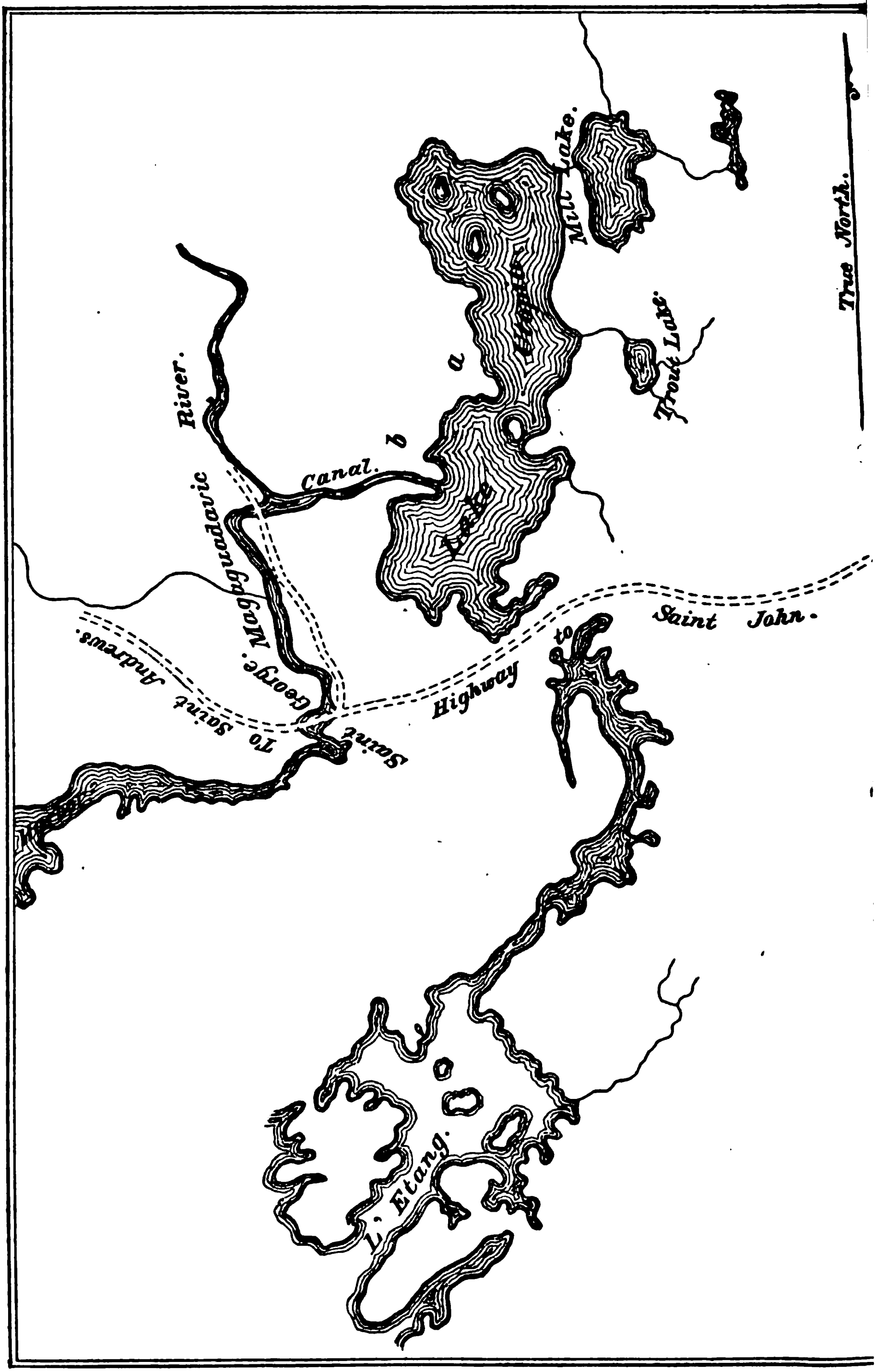
By Daniel Wing, *of South Yarmouth, Mass.*

On both banks of Bass River, which separate the towns of Yarmouth and Dennis, in Barnstable County, Massachusetts, are ancient shell heaps and stone hearths. They are particularly numerous in the vicinity of the Old Colony Railroad bridge and below the village of Georgetown; in both cases upon the Yarmouth side of the river. They are generally upon the brow of the river bank in a commanding position, though sometimes on lower ground. In diameter they vary from 4 or 5 to 15 feet, and in depth from 2 or 3 inches to 2 or more feet. They consist principally of oyster, clam, and quahaug shells. Stone implements have been found in the vicinity of shell heaps in great numbers, though not of many species. This I attribute to the fact that the Indians living hereabout used shells for many purposes. The Pilgrims on landing upon our shores found in the wigwams baskets formed by sewing together shells of the horseshoe crab. I have a collection of nearly a hundred spear and arrow points of stone, in about every form represented in Schoolcraft's large work on the Indian tribes of the United States. I have also a stone pestle, ax, hatchet, and a fragment of a stone mortar or kettle. All up and down the peninsula of Cape Cod are to be found stone implements of the kinds mentioned above—though in the attack upon the Pilgrims at Namskaket Creek, in 1620, the arrows used by the Indians were tipped with brass, eagles' claws, and bits of horn. This last fact led some writers to suppose that the Indians could find no suitable material on the cape for constructing their implements. Though there are no outcropping ledges on the cape, yet there are many bowlders and fragments of rock which the Indians found suited to their purposes. I know of several ancient burial places, but they have not been examined, or, if they have, I am not aware of the fact.

A SCULPTURED STONE FOUND IN ST. GEORGE, NEW BRUNSWICK.

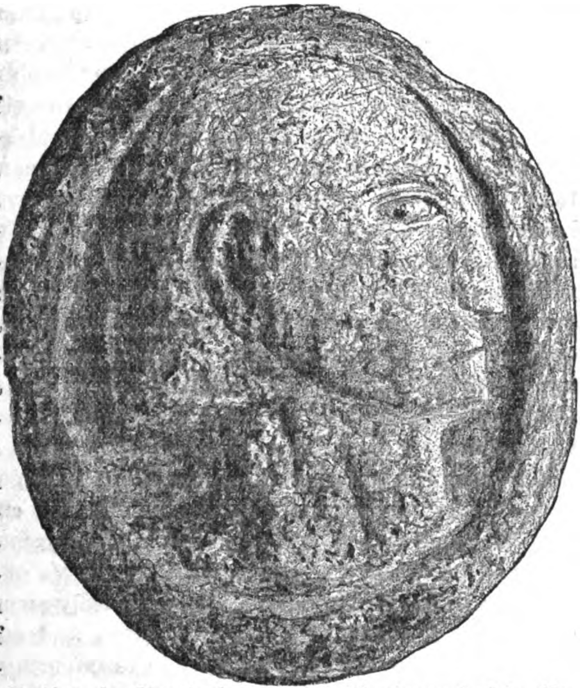
By J. Allen Jack, *of St. John, N. B.*

In the autumn of 1863 or winter of 1864, a remarkable sculptured stone, representing a human face and head in profile, was discovered in the neighborhood of St. George, a village in Charlotte County, in the province of New Brunswick, Canada. This curiosity was found by a man who was searching for stone for building purposes, and was lying about 100 feet from the shore of Lake Utopia, under a bluff of the same formation as the material on which the head is sculptured, which abounds in the neighborhood. This bluff is situated three miles or more from St. George, and Lake Utopia empties into the Magaguadavic River, or, as it may be translated from Indian into English, the River of Hills, which flows towards and pours through the village in the form of a beautiful waterfall. The stone, irrespective of the cutting, which is in relief, has a flat surface, and is of the uniform thickness of 2 inches. Its form is rounded elliptical, and it measures 21½ inches longitudinally and 18¼ inches across the shorter diameter. The stone is granulite, being distinguished from granite proper by the absence of mica. The sculpture, shortly after it was discovered, attracted a good deal of attention,


True North.
Mill Lake.
Trout Lake.
Lake
Utopia
a
b
Canal.
Magaguadavic
River.
Saint
George.
To Saint Andrews.
Highway to Saint John.
L. Etang.

and was examined by a number of persons possessing respectable scientific attainments. As far as I am aware, however, neither its visible characteristics, nor its history, or its historical associations have ever been carefully studied by any conversant with American archæology. This carved stone was found at the point marked *a* in the accompanying map. For myself, while undertaking to comment upon this interesting memento of a past age, I must at the outset acknowledge my want of qualifications for the purpose, and explain that my object is rather to suggest than to dogmatize, and to give such small assistance to the learned as is comprised in scraps of information which I have been able to obtain from various sources.

A tolerable knowledge of the history of Charlotte County and of the province, and an imperfect memory and record of the contents of several letters received from various persons upon the principal subject, are all of some service in furthering my purpose. The letters which were written to assist me in preparing a paper upon the stone, subsequently read before the Natural History Society of New Brunswick, an association not now in existence, were unfortunately destroyed in the great fire of St. John. The paper itself was preserved, and embodies at least a portion of the contents of the letter. Opinion, at the time of discovery, was somewhat divided, both in regard to the nationality of the workman by whom the stone was carved and also in respect to the object of the work. Three suggestions, one of which is probably correct, were offered by different parties with reference to the workmen: First, that he was a British colonist; secondly, that he was a Frenchman, and, thirdly, that he was an Indian. The discussion of these several propositions naturally suggests, if it does not necessarily involve, in each case a consideration of the motives of the workman. I have little hesitation in dismissing, as highly improbable, the hypothesis that the artist was a British colonist. The appearance and position of the stone when discovered, to which I shall presently



more particularly refer, convince me that it was not carved for the purpose of deceiving scientific investigators, as might be, and I believe has been, charged. For the same reasons I am led to form a strong opinion that the carving was executed long before the date of British occupation. Irrespective of these reasons, however, I would point to the carving itself as an answer to the theory; and the argument here makes as strongly against the suggestion of French origin as it does against that of British. The features and expression of the face are not in any respect European, neither is the shape of the head. Again the elliptical eye, appearing on a profile as it should only properly appear to the spectator in the full face, is a characteristic of Eastern, especially of Egyptian, art. I have not the means at hand to verify the opinion, but, if my memory serves me rightly, this same peculiarity appears in delineations of human faces among the ancient Mexican Indians, if not among other American tribes. The theory for which I contend is, that a European workman, either skilled or unskilled, would have produced something having a semblance to a European subject or work of art. The suggestion of French origin for the sculpture leads me to speak of the connection of the French with the history of this part of the province.

The earliest record of the French occupation of Acadia is that of De Monts, who with a party of fellow-countrymen passed the winter of 1604 on the island of St. Croix, situated on the river of the same name, forming the boundary between the province and the State of Maine, and distant about twenty-one miles from the village of St. George. I have never heard of there being any considerable number of French settlers in the neighborhood of St. George, and cannot even say with certainty that there were any French families permanently settled there. L'Etang approaches to within 300 feet or so of Utopia, and La Tête Passage is distant about eight miles from the village, and the occurrence of these names may lead to the inference that there was a partial French occupation of the adjacent country. I have indeed heard of inscriptions on the rock at Black's Harbor, or its vicinity, on Bliss's Island, which are supposed to be in French, but have never met any one who had actually seen these inscriptions. This island is nearly half way between Campobello or Deer Island and Utopia, from which it is about ten miles distant, and opposite the mouth of La Tête Passage. By no hypothesis, however, am I able to connect this curiosity with any European custom or idea, and consequently the remainder of my investigation will be devoted to the argument in favor of its Indian origin.

If it is possible to derive approximately accurate information as to the age of the stone from its situation and condition when found, it would of course assist materially in discovering the nationality of the workman. I believe that the finder, who, as I have stated, was searching for stone for building purposes, was attracted by the shape of the stone in question; that it was lying on the surface and covered with moss, and that it was not until the removal of the moss that the true character of the object appeared. An examination of its surface must, I think, convince the observer that the stone has been subjected to the long-continued action of water, and from its situation it seems fairly certain that the water which has produced the wasted appearance was rain, and rain only. An expert might perhaps form a tolerably accurate opinion as to the period which would be required for ordinary rainfalls to effect such results as are here plainly visible. For myself, I hesitate to speak of the precise period where the stone showed no marks of rain. I feel, however, that I am safe in expressing the belief that it would require a length of time commencing at a date before a Frenchman is known to have set foot in the country to produce from the action of rain so worn a surface as this stone exhibits. If this proposition is correct, there can be no reasonable ground to doubt that the carving is the work of an Indian. I may refer, but solely for the purpose of expressing my disbelief in any such hypothesis, to the suggestion that art, employed for the purpose of deceiving, and not any force of nature, has produced the worn appearance to which reference has been made. The mossy deposit, and the unfrequented locality in which the curiosity was found, both aid in dispelling this idea; but even had it been found in an often visited part, and without its mossy covering, I should have no hesitation in affirming that its worn appearance was not due to the hand of man. I may further urge that, had the object of the workman been solely to deceive, he would have scarcely selected a stone whereon to carve of a granite character, and especially a piece of granulite, one of the hardest of rocks to work, being not only hard in quality but of crystalline structure, and ill-adapted for receiving a polish, at least under rough tools. Granting, however, that for the reason stated we are justified in assigning the origin of the carving to the Indian period, there still remain many difficulties in the way of determining its object or meaning. There are at the present time several Indians in the neighborhood of St. George, but half a century ago there were many more in that locality, and previous to the commencement of that period the vicinity of the canal, about one and one-half miles from the bluff mentioned before, was continuously a favorite camping ground for these people. The Magaguadavic Lakes abound in fish, even at the present day, and the surrounding woods, formerly well stocked with all kinds of game, would prove a great attraction to the savage hunters, and the proximity of the sea would also add to the attractions. The Magaguadavic Indians speak the Milicete language, and are, I believe, members of that tribe, and are, of course, descended from the Algonquins. I speak with some hesitation of their being Milicetes, because I understand that the Passamaquods claim to be distinct from the Milicetes, and there may be some question whether Magaguadavic Indians were not a portion of the former tribe. A very obvious question presents itself to the mind of the investigator, which may here very properly be considered. What purpose would an Indian have in view in producing this curious work of art? In the paper which I read before the New Brunswick Society I was unable to give any tolerably satisfactory reply to this. At the present time I think that I can suggest an answer which may be correct, and which, at least, deserves some consideration. The members of that society were, if I mistake not, generally impressed with the force of the arguments brought forward to support the suggestion that the sculptor was an Indian, and were inclined to guess that the carving was, in some indefinite way, connected with the funeral rites, or was in commemoration of a departed brave. No work published at that time afforded any solution of the difficulty. No relics of a similar character to this had been dug up at any Indian burial ground in New Brunswick, and although our Indians produce very well executed full relief figures of the beaver, the muskrat, and the otter, upon soapstone pipes, their skill apparently goes no further in this direction. I have indeed seen rude sketches of human figures executed by these people, but have never seen or been informed of any likeness to a man being carved by them in stone. It was only by bringing pieces of information together, and after the lapse of some years, that I was enabled to suggest an answer to an apparently almost unanswerable question. Upon one occasion, while in conversation with an old resident of St. George, he gave me an account of a somewhat singular monument which, many years before this period, stood on the summit of a high hill near the canal, and about one-half mile distant from the place where the carved stone was found. It consisted of a large oval or rounded stone, weighing, as my informant roughly estimates, seventy-five hundred weight, lying on three vertical stone columns, from ten inches to one foot in height, and firmly sunk in the ground thus . · . (The above weight, I should imagine, is an over-estimate, but I give it as stated to me.) The site of this monument is marked *b* on the preceding map. My informant stated that the boys and other visitors were in the habit of throwing stones at the columns, and that eventually the monument was tumbled over, by the combined effort of a number of ship carpenters, and fell crashing into the valley. Some years afterwards I read, for the first time, Francis Parkman's "Pioneers of France in the New World," when my attention was at once arrested, and the conversation with the gentleman from St. George brought to my mind, by a passage which occurs on page 349, of that highly interesting work.

Champlain, the writer states, had journeyed up the Ottawa River beyond Lake Coulange, and had reached an island in the neighborhood of the village of a chief named Tessonat, which, Mr. Parkman is of opinion, was on the Lower Lake des Allumettes. I quote what the historian writes of what the French explorer sees: "Here, too, was a cemetery, which excited the wonder of Champlain, for the dead were better cared for than the living. Over each grave a flat tablet of wood was supported on posts, and at one end stood an upright tablet, carved with an intended representation of the features of the deceased."

Now, it may be that there is no connection whatever between the Indian custom described by Champlain, as existing at the place described, and the finding of the sculpture and the appearance of a large stone, supported on stone columns, at a place in New Brunswick. The points are certainly far apart, and while in the one case there is clear evidence of the common custom, there is in the other barely sufficient evidence to justify the supposition that there may be a single instance of the adoption of the custom. The Magaguadavic Indians indeed have a tradition that they were driven from some distant part of Canada to the seaboard, but if this were established as a fact, it would scarcely aid in the elucidation of this matter. Two conjectures may be made, however, either of which if correct might account for the supposed existence of an Ottawa custom in New Brunswick. An Indian might have been captured, or might have been expelled by his brethren on the Lower Lake des Allumettes, and been carried, or have found his way, to the maritime province. Or, a young Milicetes might have been carried away by the Ottawas, and have escaped to his old home. In the one case the prisoner would naturally wish to secure for his burial place the monuments which had ornamented the graves of his fathers, and might have succeeded in securing the aid of his captors in the accomplishment of his object. In the other the escaped captive might well desire to adopt the arts of his former masters, and wish to take his last rest beneath a monument with his effigy at its head. The use of a large stone instead of a wooden tablet scarcely deserves comment, for the change of material would in no sense interfere with the object in view, but on the contrary would render the monument more deserving of the name.

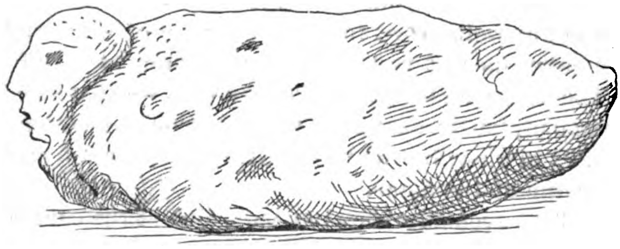
I think that a careful or even superficial examination of the carving must impress the observer with the idea that it is intended to represent the face of an Indian, and the head, although viewed only laterally, certainly presents many of the peculiarities of the North American type. Of course the examiner is placed at a great disadvantage in having only a profile, and not a completely developed head, as for ethnological purposes craniology is chiefly available when an opportunity is given to measure the comparative breadth from the petrous portion of the right, to the petrous portion of the left temporal bone, or to measure from and to the parts of a carved head representing these portions. There is a portrait of a Magaguadavic Indian by Mr. C. Ward, of St. George, which is considered to present some points of resemblance to the head in discussion, which may be found in the Illustrated London News of the 5th of September, 1863, No. 1220. The fashion of wearing the hair as represented by the carving is perhaps somewhat calculated to puzzle the investigator, but there is scarcely anything sufficiently definite in the delineation to enable one to trace an analogy to either Indian or European fashions. It may be noticed that some have expressed an opinion that a wig was intended to be represented.

A SUPPOSED SPECIMEN OF ABORIGINAL ART,

Discovered at Gondola Point, parish of Rothesay, in Kings County, New Brunswick, and exhibited at the Provincial Exhibition held at the Mechanics' Institute, St. John, New Brunswick. (Autumn of A. D. 1851?)

BY G. F. MATTHEW.

Living in the neighborhood of the spot where this object was found, I undertook, at the request of J. Allen Jack, esq., to make inquiry into the circumstances connected with its discovery. It had been found, I was told, on the farm of Andrew Kilpatrick (now owned by David Kilpatrick), about half a mile from the Episcopal church, near Gondola Point. It was turned out from a depth of between three and four feet below the surface of the ground in digging a cellar on the farm referred to; and was intrusted to Mr. Harding to take to St. John and exhibit at the provincial exhibition held at the Mechanics' Institute (in the year 1851?)



In general outline the object, which is a rough-looking stone, is of an oval form, 2 feet 11⅝ inches long, 1 foot 3½ inches broad, and 1 foot 2⅞ inches deep; and as regards most of its surface does not differ from an ordinary bowlder of Lower Carboniferous conglomerate, numbers of which lie scattered around the neighboring fields. This conglomerate consists chiefly of pieces of granite, and protogene in association with less numerous, but characteristic fragments of crystalline limestone of the upper series of the Laurentian area, the border of which lies about a mile to the southward of the point where the bowlder was found. I am satisfied, therefore, that the bowlder was not brought from a distance, but belongs in the neighborhood where it was dug up.

While, as regards most of its surface, this stone does not differ from an ordinary bowlder, there is an exception in the appearance of one end. This has been carved into the form of a human head, looking out, as it were, from the end of the stone. The features are aquiline, rudely carved, and somewhat irregular, as though chiseled by an unskilled hand. They present the appearance of having been worked out upon the surface of the stone by using certain hard protuberances as the basis for the more prominent features and graving the rest to correspond. The artist has apparently seized upon a rude semblance of the human face presented, and worked out the finer lineaments to correspond.

On examining the carved head carefully it was found that the surface had been coated with a dark-red pigment. This could hardly have been on the stone when it was dug up, if, as I was assured, it came from a depth beneath the surface of three feet or more; and for the following reasons I suppose it to have been painted after it was exhumed.

An examination of the bank or hillside where the relic was found revealed the presence of "Drift," a deposit of the glacial and post-glacial period, immediately below the surface loam, which is a foot thick. The point at which the stone was dug up is not more than about sixty feet above the Kennebecasis River, and it would thus for a long period have been below the sea-level in the time marked by the accumulation of the Ledaleiay of which (or of the bowlder clay) the deposit containing the stone lay consisted. If buried by natural causes in this deposit the age of the relic would be carried back to a very distant period—a period so distant that one may question whether it could have had its present appearance at that time. And it seems more reasonable to suppose that if it possessed its present aspect when dug up, it must have been buried later than the Drift period, either by accident or design. The paint with which the face is covered appears to have been a subsequent embellishment, for long-continued exposure to the action of the elements would have removed the oil or other substance which serves to give body to the color, and the paint would have remained as a dry powder liable to be brushed off with the slightest touch.

The mode of burial of this stone cannot now be verified, owing to the crumbling condition of the bank, and its actual age as a work of art must remain to a great extent a matter of conjecture. The naturally rough features have been rechiseled, and (since the stone was dug up) coated with paint; so that in some respects the object is not in its pristine condition, and its value as an object or specimen of aboriginal art has been seriously marred by these changes.

ANTIQUITIES OF NOVA SCOTIA.

By Rev. George Patterson, D. D., *of New Glasgow, N. S.*

No earthworks, properly speaking, exist in this region, but shell heaps are to be found in various places. The shores of this county at various places give evidence of the former occupation of the country by the aborigines, particularly the shells, which are found in the soil as it is turned up by the plow, and the stone implements which were formerly picked up in abundance, and are still sometimes found, though more rarely. The principal places are, Middle River Point, Fraser's Point, both sides of the East River at its entrance into the harbor, Fisher's Grant, and the Beaches, all in Pictou Harbor, and almost every island

and headland in Miegomish Harbor. In the neighboring counties on the northern shore of the province, the same thing is to be found, particularly at Antigomish Harbor to the east, and at Tatamagouche to the west.

There is scarcely anything in this province that can be called a mound or earthwork, at all events like those found in the Western States. There was found some years ago, at Tatamagouche, a small heap. It was situated on the farm of the late Rev. Hugh Ross, next to A. Campbell's, which forms Campbell's Point, at the entrance of the harbor. It was opened and examined some fifty years ago by the late Dr. Thomas McCulloch, of Pictou, who found in it a large number of human bones, and various stone implements. He published no account of them, but I have learned that he came to the conclusion that it was a place where a large a number had been buried, probably after a battle. The spot has long been plowed over, and the ground leveled.

There was another found at Kempt, Yarmouth County, in the western part of the province. The spot where it was found was some fifteen miles in the interior, and some distance from the river. It was opened by Dr. Joseph Bond, of Bear River, Digby County, N. S., and from him I learned that it was about ten feet in length, five feet in width, and four feet in height. It has been represented to me as resembling a large cradle hill. In this were found forty very beautifully executed stone-arrow or spear-heads, which are now in the county museum at Yarmouth, established by L. E. Baker, esq., who has had them photographed. Dr. Bond supposed that it was an ancient burying place, though he found no bones, for which he accounted by supposing that they had become so entirely decayed as to be no longer recognizable. But Dr. John W. Webster, of Yarmouth, informed me that from the material around he believed it had been the site of an old workshop. This might be the case, and the mound might have been a *cache* of such implements.

I have seen some thin layers of shell at points on the shores of our harbors, but I am told that there are some of considerable thickness at points in Miegomish Harbor. They are generally close by the shore, and the sea, wearing away the soil, exposes them on the banks. But none in this part of the country have undergone a proper examination.

There are in the museum of the Mechanics' Institute, St. John, N. B., two sculptures. The one is very rude, and will be found figured in Dawson's Acadian Geology. The other is a medallion of about fifteen inches in diameter, containing a rather well-executed profile of a human head. But I am not certain that this was found in the province.

The rocks on the north shore of the province are soft, and are being worn away so rapidly that if there had been any carving upon them it would long ere now have disappeared. In Yarmouth a stone has been found on the shore with what looks like letters engraved on it, but they have never been deciphered. The stone is in the possession of John K. Ryerson, of Yarmouth. Dr. Gilpin, of Halifax, has discovered a rock in Annapolis County with some engraving on it. In the history of the county of Pictou, published by me, on pages 29–31, will be found an account of the only genuine prehistoric cemetery with which I have met. I could see no plan of arrangement in the graves. They would be found at distances of from three to five feet apart, and over a space of about fifty feet square, lying to the west of a pit. I was not able to find any to the eastward, that is, farther away from the shore. The graves formed a layer of brown, velvety mold, two or three inches deep, and containing fragments of bones. The ground is gently sloping and facing southwestwardly. In only one instance could I detect the posture of the body. This one was lying on its side, and doubled up. In other instances there were plainly a number together, and the bones were so decayed and seemingly so mixed, that I could not trace any order. I did not particularly observe, but I think the body lay north and south with the face to the west. The graves were shallow, not more than from nine to twelve inches deep.

There was no evidence of desiccation. But there is in the possession of Dr. Wm. Doherty, of Kingston, Kent County, N. B., a perfect mummy of an Indian head. The face retains its features, and the hair adheres as completely as in life. It was found on a part of a bank of the river Richibenclo. Along with it was found a copper kettle, showing that the burial took place after the arrival of Europeans, and while they still retained the practice of burying the valuables of the deceased with him. The skin has a bluish discoloration, probably from the copper. I am informed that up the St. John's River a large copper kettle was found with the remains of a body, which had been squeezed into it.

There are no quarries. There is an island known in the Micmac language as Pipestone Island, to which they may have resorted for materials for their pipes, but I have not been able to find the place.

The only workshops that I have heard of in these maritime provinces is what is known as Bockman's Beach, Lunenburg County, N. S. It is a beach of sand and gravel, running east and west, perhaps 300 yards in length and connecting an island, known as Bockman's Island, with the main-land. On the north side the sea has heaped up the sand and gravel, but in the rear of this it is lower, and here, about midway between the shores, have been found large quantities of flakes and splinters of stone and arrow-heads in various states of preparation. Many of these have been carried away by collectors, but the sea washes over the spot, and after every storm more are exposed.

A small circular heap, about 6 feet in diameter, and from 15 to 18 inches high at the time of my visit, has been supposed by some to have been the seat of the ancient arrow-maker. But on close examination of the spot and from information received from those living in the neighborhood, as to the changes effected upon the shore by the action of winds and the sea in storms, I could easily see that the sand around it had been swept away, leaving this spot a little above the head of the surrounding beach. In fact changes have been going on which render it impossible to ascertain how the ground lay in those old days. But the amount of splinters, hammered stones, &c., plainly shows what had been going on. These principally consist of agates and jaspers, which are not to be found in any rocks near, but are similar to those found at the present day in the trap rocks bordering on the Bay of Fundy, forming the northern mountains of King and Annapolis Counties, distant, in a direct line across the country, nearly sixty miles. A few are of the dioritic rocks, which are found intrusive in the southern mountains of the same counties, and some are of quartz, such as is found in the metamorphic rocks in the immediate neighborhood. An examination of these rocks shows the process which had been going on. Here is a stone at which the old arrow-maker had been hammering, with the view of splitting it longitudinally, but the result was several cracks crosswise, and it was thrown away. Here is a disk-like stone, around the edge of which he had been hammering, but, instead of splitting through the center, it broke away in fragments to the side. And then there are flakes of all sizes and thickness. A few complete arrow-heads have been found, and a much larger number of imperfect ones. These are all small, from 1⅜ to 2 inches in length, but are very finely executed. Stones are also picked up which bear on their edges the evidence of having been used as hammers. A few stone chisels or axes have also been found, but it is evident that the work carried on was mainly of forming arrow-heads, for which they brought from the Bay of Fundy the finer stones mentioned. Small pieces of copper are also found. They consist sometimes of small nuggets seemingly in their natural state, sometimes they are flattened out by hammering, and they are also formed into small knives or piercers.

There were portages, where they carried their canoes from one lake or stream to another, or across a headland. These were mere paths through the forests, and are now either grown up with wood or have been plowed up.

I have some small copper knives and small specimens of copper, the latter from Lunenburg County. It has commonly been supposed that the Micmacs were entirely ignorant of the use of metals till the arrival of Europeans. These show that they had at least got to the length of making use of the small specimens of native copper found in the trap rocks of the Bay of Fundy. I have also some bone spear-heads, a good deal decayed, from some cemetery; also, a pipe from the same place. It is made out of a very hard granitic rock, and Dr. Dawson, of McGill College, Montreal, our highest authority on the geology of these regions, says that he knows no rock of the same kind nearer than Bay Chaleur, and, furthermore, he has since received a number of pipe-heads, resembling it in shape, from the Upper Ottawa.

There is, in the Provincial Museum at Halifax, a collection of various aboriginal antiquities. It contains, besides the usual stone axes and arrow-heads, some small pieces of copper, similar to those from Bockman's Beach, and a flat pipe found in the interior of the province, remarkable from the circumstance of its having been found so far east, it being held that this is characteristic of the mound-builders or tribes of the far West. There are also a few articles in the museum of the Mechanics' Institute of St. John, N. B. The most remarkable are the sculptured figure and medallion already referred to, and a small hammer with a short stick for a handle, remarkable for the manner in which it is fastened to the helve, being merely held by a band of burnt clay. Professor Jack, of the University of New Brunswick, Fredericton, N. B., is said to be the best authority in that province on this subject. In the collection of Judge Desbusay, of Lunenburg County, N. S., are also small pieces of copper from Bockman's Beach. Dr. Gray, of Mahone Bay; in the same county, also has a collection.

THE ABORIGINES OF FLORIDA.

BY S. T. WALKER.

In comparison with their number and size, the shell-heaps of Florida contain but few relics of the people who constructed them. Besides the ashes of their fires, the refuse of their feasts, and the fragments of their utensils, we find but little to aid us in our researches into their civilization or condition. The shell-heaps are so vast in size that it is only when the sea has swept away their slopes or when the lime burner has attacked their sides that we get an insight into the mysteries of their interior, and even then there is little to be obtained and but few uncertain data given upon which to base a calculation. By far the greater mass of these heaps is composed of shells, bones of mammals and birds, ashes, charcoal, and thin layers of soil. Scattered throughout the heap however there are quantities of broken pottery and near the top, a few objects of stone, and numerous implements of bone or shell.

The accompanying diagram represents a section of a shell-heap at Cedar Keys, Fla., formed by cutting through the center of a mound to open a street. This may be considered a fair representation of the interior of all shell-heaps with the exception of the unusually thick stratum of soil near the center of the mass. From this it will be seen that the pottery is pretty uniformly distributed throughout the heap from the bottom to the top and is generally in small fragments, most probably pieces of pots and utensils accidentally broken during the ordinary culinary operations of their owners. I have never known a whole vessel to be found in a shell-heap. An examination of this pottery, then, it seems would give us a pretty correct idea of the progress of the aborigines in the art of pottery during a period of time corresponding with that of the age of the shell-heaps. An inquiry therefore into this progress among the builders of the shell heaps necessarily involves a question of time, and is by far the most difficult part of the subject.

SECTION OF SHELL-HEAP.

Six inches of modern soil.
(Later stage.) Fine thin pottery beautifully ornamented. Neatly-made implements of bone, shell, etc. Axes, arrow and spear heads of stone; also stone-beads and objects of stone used in games. Three feet.
Two feet of soil containing a few fragments of pottery.
(Middle stage.) Better pottery, rudely ornamented. Primitive implements of bone and shell. Four feet.
(Earlier stage.) Rude, heavy pottery, destitute of ornament. Three feet.

In the section of the shell-heap given in the illustration, it will be seen that a stratum of soil six inches in thickness has accumulated since the completion of the mound, and that a similar stratum nearly two feet in thickness occupies a position near the center of the mass, indicating a cessation in the growth of the heap, when it had reached a height of seven feet, for a period of time sufficient for the accumulation of this two feet of soil on the surface of the shell. After this the accumulation of shell begins again, and when it had acquired a depth of three feet it ceased again and this time forever.

Now, we know pretty well how long a period has elapsed since the aborigines ceased to inhabit this region, and although it is possible that there has been no addition to this heap for seventy-five or one hundred years, we know positively that there has been none for the last fifty years. It requires then at least fifty years to accumulate six inches of soil on a shell-heap, and consequently we may be justified in supposing a period of two hundred years to have been necessary for the formation of the central stratum of soil in this mound.

A comparison of the pottery immediately above and below this stratum of soil representing a period of two hundred years ought to give us some idea of the rate of progression made in the arts. And a critical comparison of the different styles of pottery with each other in different portions of the heap should give us a rude idea of the age of the shell-heaps. The object of the present paper is to present the reader with a description of the relics and pottery found in each stratum of the shell-heap, beginning at the foundation and ending at the top, and from a comparison of the various styles which mark the march of progress and improvement, to hazard a conjecture as to the time which elapsed from the beginning of the shell-heaps up to the advent of the European.

In all the large shell-heaps examined hitherto I have invariably found pottery in the lowest stratum of shell, and, in many instances, in the soil beneath the foundations, which I regard as conclusive evidence that the aborigines were acquainted with the art of fabricating earthenware pots long before they began these vast accumulations of shell. The art however was in its rudest state. The fragments are thick, heavy, and coarse, the composing clay often containing a mixture of coarse sand or small pebbles. The utensils were of large size and rudely fashioned, as shown by the curves of the fragments, and they were destitute of all attempt at ornament. The rims were plain, and were not thickened or re-enforced to increase their strength. This style is found generally for about three or four feet in height, and may be said to repsent the first stage. Above this a gradual change is perceptible, the two styles overlapping, so that it is difficult to say where one begins and the other ends.

The second stage however as we ascend, soon becomes plainly marked. The walls of the utensils become thinner. The rims are turned outward and slightly thickened. Dots and straight lines are cut into the sides of the vessel by way of ornament, and the thickened rims are sometimes "pinched" like pie-crust with the fingers. During this stage the savage artist first began to mold his wares in rush baskets, which were subsequently burned away, leaving the vessel curiously checked as though it had been pressed while wet with coarse cloth. The use of sand or gravel is totally abandoned during this stage, and the quality of the pottery is in every way improved. Implements of shell and bone are sometimes found, but they are generally few in number and rude in manufacture.

This brings us to a portion of the shell-heap corresponding in position with the two-feet stratum of soil shown in the diagram, and that stratum marks the transition period between the middle and modern styles of Indian pottery. Immediately below this layer of soil we find the curved line introduced in ornamental designs on the utensils, and a few fragments of the rims of pots show that ears began to be attached to them for the convenience of suspension, and that the thickness of the ware was reduced by the employment of better materials. Immediately over the stratum of soil all the fragments show improvement on those below. New patterns are introduced, and we begin to find fragments of dishes, bowls, cups, as well as those of jars and pots, many of them of elegant design and of a superior quality of ware. Stone axes, arrow-heads, bone and shell implements are of frequent occurrence.

As we approach the top, marks of improvement are numerous. All the larger pots are furnished with numerous ears, through which strings might be run for suspension. Vessels are sometimes furnished with handles, and all the finer wares are elaborately ornamented with zigzag lines, curves, dots, and, in rare cases, with figures of men and animals. The finest wares are invariably found on or near the surface, and among them we find the first attempt at coloring their work.

We thus observe that from the testimony of the pottery the age of the shell-heaps is divided into three distinct periods, which may be styled the ancient, the middle, and the modern, which are further divided by two periods of transition, the latter of which is marked by the stratum of soil representing a period of two hundred years. Assuming that the march of improvement was uniform, and seeing that a period of over two hundred years* was occupied in a transition from the middle period to the modern, I think we might be safe in attributing a period of at least two hundred years to each of the five eras mentioned above. This would give one thousand years for the age of the oldest shell-heaps.

I might properly extend this time much beyond these figures, as there are many shell-heaps which were abandoned fully as long as this upon which there is no accumulation of soil, or at best but little, so it would seem that I have adopted the smallest period of time necessary to a correct calculation, still these calculations may be far from the truth. There are so many possibilities to be encountered that the question of age is lost among them. The growth of a shell-heap depended, of course, upon the number of people living in the vicinity, whether their residence was continuous or occasional, the abundance or scarcity of shell-fish, and many other accidents too numerous to mention. Layers of soil in different portions of the same heap show that portions of the mass ceased to grow for long periods of time, while thick strata of clean shell indicate the rapid and continuous growth of other portions. Future investigations may throw more light on this subject at present involved in doubt and mystery.

The key to the whole matter is a critical study of ancient pottery. That the aborigines of Florida reached the state of advancement in which they were found by the Europeans by slow and painful steps is evident to the most superficial observer. That they did advance is equally plain. According to the estimate of time made in this paper it was three hundred years before they thought of ornamenting moist clay with lines and dots, and five hundred years before they thought of making ears to pots. Dishes and bowls were not thought of for eight hundred years, and cups with handles for nearly one thousand. Still they progressed, and who can say what point their civilization might have reached had the discovery by Columbus been delayed another thousand years?

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*I say "over two hundred years," because this transition began in the latter years of the middle period and continued in the earlier years of the modern period.

ABSTRACTS FROM ANTHROPOLOGICAL CORRESPONDENCE.

Numerous correspondents of the Institution, in writing upon various matters, frequently convey valuable information. It is the design of this chapter to put on record those statements of correspondents respecting archæology that are not sufficiently long to form a separate article.

Stone graves

BARKLEY, W. F., writes that about 15 miles from Mount Pleasant, Pa., are the remains of a burying ground, in which the dead are interred beneath piles of stone.

Rock carvings

CARRUTHERS, ARTHUR, writes that in the western part of Amherst Township, Lorain County, Ohio, on the farms of Joseph Rice, David Shevarts, and others, are sandstone rocks rising about 1 foot above the ground and from 6 to 50 feet across the top. They belong to the Waverly sandstone. The impressions of Indian moccasins, bears' tracks, turkey tracks, and those of small birds are very plentiful. They do not all run in the same direction, but cross and recross one another.

COUES, ELLIOTT, mentions a cliff-house on Beaver Creek at its junction with the Rio Verde, 40 miles from Fort Whipple, Ariz.

FERRY, C. M., of Oneida, New York, mentions the opening of a trench of buried Indians. Part of the bodies were in wooden coffins, plainly indicating recent burial. Some of the dead had been wrapped in blankets, and a child's moccasin was ornamented with glass beads. Buttons and bricks also add their testimony to the fact that the cemetery is not ancient.

[illegible]

FLINT, EARL. Rock inscriptions extend all along the summits of the Cordilleras, from Bolivia to Mexico. They are similar in character. At Telembela, in Ecuador, is a sacrificial stone, similar to that in Mexico. A sculpture of a chief with a scepter in each hand, surmounted by a condor, and standing on the prostrate form of a supplicant, was found in Peru. This resembles very much the figure in the Palenque stone, but it is coarser. At Samiapata, near the top of the declivity, sculptured in relief, is a figure of a tiger. A little higher up is a similar one, more massive, from which a double series of rhombs lead from the sculpture to a kind of throne, supported on four feet of a bird of prey, surrounded by a circular line of seats. These all join to form the body of the cross. The top is in shape a species of platform, on which are chiseled hemispheric holes, one yard in diameter, communicating with one another by small canals. Sculptures of this class occur from Bolivia to Columbia. Lower down, at Samiapata, are niches cut in the rock, and buried near them are inscribed stones. Similar ones, and less elevated, where the Cordilleras separate the territory of Chaco from Chiriquanes, occur in a real desert, and being on a declivity, have escaped the alluvial burial of the first. Inscribed on the stones found at Chaco and Samiapata and those of the niches are the same persons, figures and paintings as those on the murals of Palenque.

Graham, N. B., writes that there is a mound four miles south of England's Point post-office, Cherokee County, North Carolina, on the farm of Jesse Raper. It is the only mound within ten miles, is circular in ground plan, 120 feet in base diameter, and 90 feet apex diameter. It is composed of alternate layers of burnt clay, ashes, and soil.

Harlan, Calvin S., describes a cave in a rocky hillside, four miles from Ellora, Baltimore County, Maryland, known as the Old Indian Cave. It extends into the hill about 36 feet. Around the entrance are ashes and charcoal, which are also mingled with the earth about the floor; oyster shells, some of which show the action of fire, occur in the *débris*. Arrow-heads are also reported to have been found.

About one and a half miles from Sweet Air, in the same county, are the remains of an old Indian trail, leading from the Rocks of Deer Creek, in Harford County, a seat of the Susquehannocks, to a settlement south of Sweet Air post-office, at which spot arrow and spear heads have been found, together with several axes.

Other localities in the vicinity of Sweet Air have been mentioned where chipped stone implements occur.

Homsher, G. W., Fairfield, Indiana, writes to the Institution that he is preparing maps and sketches of the mounds, circles, implements, &c., of Franklin County, in that State.

Burial places

Kales, J. W., sends the following report: Along the east shore of Cayuga Lake, New York, occur many relics of aboriginal populations. On the beach are found multitudes of notched sinkers. On the points these relics are most numerous. Several burial places have been discovered; one of them is on a small island opposite the village of Union Springs. The skeletons rest on a substratum of rock, about 2 feet below the surface. A large number of skeletons were unearthed about one mile north of Union Springs and 200 feet from the lake. They were promiscuously buried in a pit under about 2 feet of fine black earth, those of men, women, and children being intermingled. The skeletons of males indicated men of large size and great strength. No relics occurred in the pit.

Supposed use of manganese

Luther, S. N., writes to the Institution with reference to the former use of manganese as a degraissant in the manufacture of Indian pottery, in the vicinity of Nelson Ledges, Portage County, Ohio. These ledges are outcrops of the conglomerate, and their cavities had furnished shelter for the ancient people. In the talus and on the higher level are found areas of dark soil, rich in relics of various kinds, and among these only occur the lumps of manganese. This mineral crops out in places at Bainbridge, twenty miles away, and no nearer. Pottery fragments, showing black spots of the manganese, and lumps having a polished surface, have been picked up. Mr. Luther also speaks of a great mortar which appears to have been used in crushing quartz.

Account of fish-dance of Sitka Indians

McLEAN, JOHN J., while transmitting a meteorological report from Sitka Castle, Alaska, notes the "fish-dance," performed in honor of the arrival of the shoals of herring. "The herring are so plentiful that an Indian with his nail-studded thin board could catch a canoe full in an hour. The Sitka Indians built fires at the mouth of Indian River, and sang and danced their national airs every night for more than a week. I witnessed several of the dances at the arrival of the fish. None but the men participated, the women sitting around the fire and keeping up a shrill monotonous chorus. The dancing movement consisted in a step from one foot to the other and stamping to emphasize the music, the body more or less stooped, and the head jerked from one side to the other in rapid movement. The melodies were extremely simple, containing three or four notes. The time was now slow and stately, like a funeral dirge, again quick and lively. There were numerous pauses, each ushering a slight modification of the melody and time. On the whole the tune was not inharmonious, having a barbaric fitness to the people and the occasion. They seem to have an appreciation of the picturesque, for they had chosen one of the prettiest spots in the whole neighborhood for their festivities. The dark snow-capped mountain for a back-ground and the broad waters of the beautiful bay, lit up by the full moon. The subject of the songs was a description of hunting and fishing. Their costume consisted of blankets with tin tags, sewn on, jingling with each movement of the body, wigs made of oakum and eagles' feathers, and blackened faces striped with vermilion. The sports were kept up each night until a late hour."

Notes on antiquities.

MACLEAN, J. P., describes and figures in his letter of December 10th two circular inclosures in Sycamore Township, Hamilton County, Ohio.

He also found on Blennerhasset Island numerous antiquities, among them a shell heap, 100 feet long. He reports that Dr. G. O. Hildreth, in sinking a cistern a little west of the Graded Way, Marietta, Ohio, came upon a cave containing human and animal bones. The cistern was commenced 15 feet below the plain, on a side hill. Six feet below the surface the diggers came upon a solid mass of concrete, composed chiefly of quartz pebbles. Below this was a cavern one foot in height, on the floor of which were the bones above mentioned. There was no outlet to the cave, and it is to be supposed that by the filling up of the ravine the original opening was closed. In the Marietta Works* a line of embankments leads from the mound inclosed by a circle to the square containing 27 acres. Recently, in cutting down a portion of this embankment, near the fence, the workmen came upon a circle composed of sandstone pestles and round balls, arranged radially, the balls alternating with the pestles.

Mounds in

MONTFORTH, WARREN. There are located in the vicinity of New Liberty, Owen County, Kentucky, a few mounds. There are a number of mounds in the "bottoms" along the Ohio River, and on the hill-tops not far from the Kentucky River. There are others in secluded spots. One of them, about 50 feet in base diameter, and 15 feet high, is situated at the junction of two small streams, about a mile and a half from the Ohio River, in Gallatin County, surrounded on all sides by high hills. It has been cultivated a number of years and many relics have been found.

Mounds

NULL, JAMES W., sends the following account of mounds, &c., in the neighborhood of Reel-Foot Lake, in Western Tennessee, a body of water 20 miles long and from 2 to 5 miles wide, formed by the sinking of the earth during the earthquakes of 1811 and 1812. Near Thompson's landing is a group of seven mounds within a space of 3 acres, circular in outline, 5 feet high, and 20 or 25 in diameter. Some were bare, others had large trees growing upon them. A large tree uprooted revealed the structure of one to be a layer of soil over a heap of sand. One-fourth of a mile north is a group of eight, very similar to the former in every respect. A few hundred yards further north is a group consisting of a central mound, about 3 feet high, kidney-shaped, 100 feet long, and 40 to 50 feet wide, surrounded by a number of circular mounds 2 to 3 feet high. Several isolated mounds were discovered larger than those in groups. Dyer, Obion, and Lake Counties are all said to be rich in aboriginal remains.

PALMER, EDWARD, reports mounds and graves at Niles Ferry on the Tennessee River, at Chattanooga, and at points near Nashville.

PEET, S. D., announces that he has been prosecuting the survey of the mounds of Wisconsin during the past year at his own expense.

RICE, H. B., announces the discovery in South Florida of crania having a peculiar shape. "They are without foreheads or depressions at the root of the nose. A number were buried close together, inverted, and in proximity to normal skulls erect in position, all partly decomposed. The crania do not exhibit evidences of flattening."

RUSBY, H. H., describes a cave near Silver City, N. Mex.

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* "Ancient Monuments of the Mississippi Valley," by E. G. Squier and E. H. Davis: plate xxvi.—*Smithsonian Contributions*, vol, i.

STOCKTON, J. B., Toronto, Kans., reports that there are no mounds in that vicinity. A cave near the town is reported to have carvings on the walls.

Mounds, &c

TANDY, W., of Dallas, Hancock County, Illinois, excavated a mound near that place, which had been the burial place of warriors. All the skeletons were those of adults; ten of the crania and a vertebra having arrow-points sticking in them. There are about thirty mounds in the vicinity of Dallas, of which Mr. Tandy will make a map.

Mounds, &c

WALKER, S. T., writing from Milton, Florida, makes the following mention of antiquities: "I know of quite a large mound containing bones on the Withlecoochee River, seven miles north of Crystal River post-office, from which human bones have been taken; another is situated 28 miles north of Milton, the most wonderful that I have seen. It is one hundred paces in circumference."

He also states: "I have sailed over five hundred miles, and located many mounds, shell heaps, sites of ancient villages, cemeteries, &c. The most important discovery was that of an ancient canal leading from the head of Horseshoe Bayou into the fresh-water lakes of the interior. This canal is about 10 or 12 feet wide, and must have been originally from 6 to 15 feet deep. It is as straight as an arrow, excepting an obtuse angle in one place. Estimated length, one mile. Large pines grow on the embankments and cypresses, 2 feet in diameter, in the bottom of the trench. The lakes, connected by this canal, are about 7 or 8 miles long, and are famous for the immense numbers of fish which they contain. All along Four-Mile Point shell heaps abound, and low mounds, from 1 to 2 feet high, are scattered through the woods for miles. These were undoubtedly built for residence, each being large enough to accommodate a single house, excepting a few which are large enough for half a dozen. East and west of Four-Mile Point the signs of ancient occupation grow gradually less, especially toward the mouth of Choctawhatchie, where a single sand mound exists. West of this, at Indian Bayou, there is a large domiciliary mound and several shell heaps. No more occur until East Pass is reached, where are several small heaps and a cemetery. The burials seem to have been made in separate graves, some being covered with a species of clay or coquina rock. At Camp Walton, or Brook's farm, on the mainland, at the head of the sound, were discovered fifteen large shell heaps and a large domicile mound, 15 feet high, 135 feet wide, and 300 feet long, containing a layer of shells and some human remains, while all through the hammock there are dozens of small circles of earth, &c. At Black Point, at the mouth of Garnier's Bayou, was found a large sand mound, 10 feet high, with a circular base about 200 feet in diameter, and having a sloping roadway to the top.

"Although no oysters now live in Choctawhatchie Bay, they once existed there in vast numbers. The heaps are composed almost entirely of this shell, and they were are as large as they ever grow in this latitude. Scallops also were once numerous, but now are entirely extinct. The cabbage palm and the pelican have also vanished within the memory of old men."

WIGGINS, JOHN B., announces the discovery of the mound where the Indians buried their dead after the battle between the Shawnes and the Nanticohes, at Nanticoke, Hanover Township, Luzerne County, Pa.

WILLIAMSON, GEORGE, calls attention to works near Marksville, La. South of that place is an embankment extending from a bluff on an old channel of the Red or some other river, a distance of a mile or more. The embankment is from 8 to 12 feet high and is flanked on the outside by a wide, deep ditch. In several places appear to have been sally-ports, and large old forest trees are growing on the bank. Inside the work are two large mounds, one of them covering several acres. In this vicinity are a great many mounds, some of them of great size. The remains are on the first high land on the bank of what was once a river channel, communicating with the Atchafalaya.

WILTHEISS, C. J. incloses testimony of A. J. Templeton and Joseph Defrees with reference to finding two tablets in a gravel bank within the corporate limits of Piqua, Ohio, on the land of Wilson Morrow. One of these tablets was 15 feet from the surface, which was covered with 4 feet of loam. On the surface of the object were "characters" and in the center lead inserted. The second was found the next day in the loose gravel which had caved down.

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MISCELLANEOUS PAPERS

RELATING TO

ANTHROPOLOGY.

FROM THE SMITHSONIAN REPORT FOR 1882.

WASHINGTON:
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PAPERS RELATING TO ANTHROPOLOGY.

THE GUATUSO INDIANS OF COSTA RICA.

By Don Leon Fernandez, *of San José C. R.*[*]

My expedition to the country of the Guatuso Indians resulted happily. We succeeded in penetrating to the very *palenques* (habitations) of the Indians, who fled to the forest on our approach, having abandoned all their instruments, arms, provisions, and utensils. By following the tracks of the Indians we managed to visit several of their *palenques*, but it was not possible for us to surprise one of them. Notwithstanding the ferocity and courage with which the Guatusos have been credited, they made no attempt to resist or do us any harm, doubtless because of our numbers, and that they took us at first for *huleros* (rubber men), who are for them the creatures most abhorred, on account of the depredations which have been committed, children seized and taken to Nicaragua to be sold as slaves, men murdered, women violated, and other cruelties committed which are hardly credible in this age.

After many excursions, during which we scoured the borders of the rivers Pataste and La Muerte, the principal affluents of the Rio Frio, both navigable, we encountered a party of Nicaragua *huleros*, who, practiced in the business, had surprised an Indian and had him tied up to a tree like a beast. After some information was obtained from them, through respect for Señor D. B. A. Shiel, bishop of Costa Rica, who was at the head of the expedition, they offered the Indian for use as a guide in our excursions.

Another party of our expedition succeeded, the same day that we met the *huleros*, in surprising another Indian who was secured after much difficulty and resistance.

The two Indians were brought together in our camp, where we treated them in the best manner possible. Giving them clothing and various presents, we made them understand, through the means of the interpreter who accompanied us, that we were not *huleros* (*chiuti*) but brothers (*tzaca*), that we were going to do them all good and deliver them from the attacks of the *huleros*, and concluded by asking them to take us to the *palenques* (*upola*) where their families were, that we might give them the various objects which we showed, especially the knives and axes, with which they seemed so much pleased. They agreed to do so, and next day we set out in search of their *palenques*, they serving as guides.

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[*] Translation of a portion of a letter written by Don Leon Fernandez, on November 24, 1882, to Dr. J. F. Bransford.

They trifled with us, intending, once away from the camp, to escape, and made us walk uselessly until 9 o'clock at night without having encountered a single Indian or seen a *palenque*. Our return to camp, through the thick forest and the darkness of the night, we owed to the ability of a Tucurrique Indian who accompanied us.

Convinced that we could do nothing through the two Guatuso Indians, we resolved to send them overland to San José with a part of the expedition, while fourteen of us, taking advantage of the boat of the *huleros*, embarked at the mouth of the Pataste to descend the Rio Frio, then the San Juan, and to ascend the Rio San Carlos. It took us sixteen hours to descend the river to the village of San Carlos, on Lake Nicaragua. It is a splendid river, without a rapid, and the course of the current is barely perceptible, with sufficient depth for navigation by steamers for a long distance above the point of our embarkation. Bordered by level and most fertile lands, as proven by the luxuriant vegetation, with abundance of fish and game, there truly may be enjoyed those savage tropical scenes which, unfortunately, are disappearing, and which are so keenly relished by those who, while appreciating the advantages of civilization, love nature.

Nothing of interest was observed in the descent of the San Juan and ascent of the San Carlos.

The bishop had the two Guatuso Indians in his house for some time, with others that we had managed to rescue, found in Nicaragua, that had been seized and sold by the *huleros*. In company with them he made a second expedition with brilliant results, as, this time, he managed to see the greater part of the Indians in their own habitations, to speak with them, and inspire them with confidence. On his return several of the Indians accompanied him as far as the Rio San Carlos, where has been established for them a depot of clothing and hardware. Parties of Indians have continued to come to this post to provide themselves with hardware principally, and some have ventured as far as San Ramon, but they have not yet had the boldness to come to San José, for fear of the cold.

Some soldiers that were afterwards sent to the territory of the Indians to protect them against the incursions of the *huleros* were very well received.

So it may be said that the conquest is made, and that the Republic has taken possession of a large and important tract of territory, which is called to a prosperous and not distant future, especially in view of the probability of the early opening of the Nicaragua canal.

The lands occupied by the Guatusos are very extensive, level, fertile, and intersected by navigable rivers, with a slight incline from the right bank of the San Juan River to the central Cordillera, which divides the waters of the Atlantic and Pacific. It has all imaginable climates between that of the fresh and bracing region of San José and the heat of the borders of Lake Nicaragua.

The Guatusos cultivate largely the plantain, which is their principal article of food, maize, cacao, zuca (manioca), tobacco, sugar-cane, cotton, agi (chile), &c. They make hammocks and nets of cabuya (agave). They are robust, agile, well formed, and of good character. They are pure Indians and not white, as has been claimed, although in some cases was noticed a trace of white or negro blood. Their number cannot yet be approximately calculated, but is not less than six hundred.

I am now occupied in the study of their language, and hope to publish my results in the third volume of the "*Documentos*."[*]

NOTE, BY J. F. BRANSFORD.

Next after the Lacandones of Guatemala the Guatusos of Costa Rica have been the most mysterious Indians of Central America, and have furnished material for numberless extraordinary stories by travelers in that section. In finally settling the question of color, race, &c., Don Leon Fernandez and the bishop of Costa Rica have done a service to science, but they have given a dreadful blow to future writers of entertaining yarns about Costa Rica and Nicaragua.

This tribe, spoken of as Guatusos or Pranzos, or Rio Frio Indians, inhabit the valley between the main Cordillera, that strikes the San Juan at Machuca, and the volcanic range, which, in northwest Costa Rica, is near the Pacific. The valley is drained by the Rio Frio, which enters Lake Nicaragua less than half a mile from the point where the San Juan leaves it.

In looking up the literature on this subject, as well as on all questions concerning Central America, we turn naturally to Squier,[†] and are rewarded with a summary of what was known of these people up to 1858.

According to Mr. Squier, the first allusion to the fierce warriors of the Rio Frio was in a report to the King of Spain about 1719, by Diego de la Haya, governor of Costa Rica. Afterwards there was a legend that they were descendants of Indians who withdrew from Esparza when it was destroyed by buccaneers in the latter part of the seventeenth century. In 1750 Padre Zepeda, a Franciscan of Guatemala, spent several months with the Guatusos, who treated him kindly. He claimed to have seen more than five hundred houses. In 1756 the guardian of the convent of Esparza reported the results of Zepeda's trip, and was instructed to follow up the discoveries. He started, but got lost. In 1761 four men, spoken of as Sambos,[‡] who were captured in the mountains, were taken to Esparza and confirmed the account of houses, &c., given by Zepeda. They showed acquaintance with certain doctrines of the church, which they said had been taught them by a Padre Adam. This padre turned out to be a young man, who, after attending college at Leon, for some reason fled to the Rio Frio country, where he lived and died, not being permitted to return to his home. The cura of Esparza and a missionary started for the mysterious valley, led by the Sambos, who abandoned them as soon as they were well into the forest. In 1778 the enthusiastic Fraile Lopez made his first attempt to enter the country, over Orosi, but failed. He next tried by boat up the river, but at the sight of the first raft of the Guatusos, his boatmen turned and paddled their best down stream, refusing to listen to his entreaties to be landed. In 1782 he made a third attempt by way of Tenorio, but, after wandering in the forest for seventy-five days, he came out on Lake Nicaragua. In 1783 Tristan, bishop of Nicaragua, accompanied by Lopez, made an expedition up the river. Lopez went ahead in a canoe, and was attacked. Some of his men jumped overboard, and the others dropped in the bottom of the boat. When the Guatusos saw the devoted friar standing with only a crucifix in his hand the shower of arrows ceased and he was allowed to land. His canoemen hastened to rejoin the bishop, and we hear no more of the heroic Lopez.

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[*] *Colleccion de Documentos para la Historia de Costa Rica*, por Don Leon Fernandez. San José, Costa Rica.

[†] *The State of Central America*, by E. G. Squier. New York, 1858; page 405.

[‡] That they were really Sambos is of course hardly probable.

Finally, Col. Trinidad Salazar, of Nicaragua, informed Mr. Squier that in 1849 he took two boats with soldiers up the Rio Frio. After traveling for several days he was attacked from ambush, was wounded, and his party repulsed.

Our next authority, Froebel, who visited Central America after Mr. Squier, gives a version of Salazar's experience, in which all were killed except the colonel. He was informed that not only were no foreigners allowed by the Guatusos to enter their country, but members of their tribe who had been in captivity were killed when they returned. "They are said to be of fair complexion, a statement which has caused the appellation Indios Blancos, or Guatusos, the latter name being that of an animal of reddish brown color, and intended to designate the color of their hair."*

Froebel also gives the very romantic experience of a German youth with these Indians—the Pocahontas story adapted.

Mr. Squier, writing again in 1860, says that the valley of the Rio Frio "is estimated to be at least 150 miles long by from 80 to 90 broad." "Of the Indians, called Guatusos, inhabiting this district, of whom nothing is positively known, the most extraordinary notions are entertained by the people of the adjacent states. They are reputed to be above the ordinary stature, with comparatively light complexion, and red hair; and tales are told of some of their women having been seen by hunters and others as fair and beautiful as the fairest Europeans."* While Mr. Squier gave no credit to such reports, he thought that in isolation their character, habits, language, religion, &c., had probably remained unchanged, and would reward the successful explorer.

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* *Seven Years' Travel in Central America*, by Julius Froebel. London, 1859; page 24. See also his *Aus America*, Leipzig.

Vigne, writing in 1863,† simply states that according to hearsay there is a tribe of fair Indians, supposed to be descendants of Spaniards, two days' boating up the Rio Frio.

That entertaining writer, Frederick Boyle, says: "Everything connected with this fierce race is enveloped in awful mystery, but it is curious that all accounts give them an origin far from their present seats. The story current in Costa Rica cannot fail to interest the Englishman, even if he be not converted to a belief in its truth. When Sir Francis Drake retired to the Pacific shore after the sack of Esparza, say they, a large body of his men mutinied in mad hopes of holding that town against the creole forces, and resting peaceably there. Drake left them to their fate. But when the Spanish army assembled and the mutineers found themselves nearly surrounded, they hastily retired through the forest of Merivalles."‡ Their intention was to reach the Mosquito coast, but they were never heard of in that region, and many people believed that they stopped on the Rio Frio.

Another story given to Boyle, to account for the color of the Guatusos, was that the Indians made a descent on Spanish settlements and carried off thousands of women. That story was rejected. Before his arrival in Nicaragua an American filibuster and three Frenchmen had tried the river. After ascending for several days they rounded a sharp turn and came suddenly on an Indian who was standing on his raft spearing fish. Apparently not at all disconcerted he picked up his bow and drew an arrow to the head. Then for some reason dropped that arrow and took another, but before he could shoot he was fired on and killed. The white men not caring to encounter Indians of this resolute character turned back. They described him as looking like a Comanche.

The naturalist Belt saw five Guatuso children in Nicaragua who had the common Indian features, though he thought they seemed unusually intelligent. He believed the name of the tribe had nothing to do with the color of their hair, but had been acquired as in other cases where the name of an animal is borne.§

Mr. William M. Gabb, who has given the best account of the Costa Rica Indians,‖ said he had seen several persons who had visited the valley of the Rio Frio, but their stories were too wildly extravagant to be entitled to repetition. General Guardin, President of Costa Rica, told Mr. Gabb that the Guatusos encountered by him on a military expedition in their country, were ordinarily of the color of Indians, but there were some exceptions of comparatively white skins and brownish or reddish hair. Guardin said that when Esparza was sacked by English freebooters a number of the inhabitants, many of whom were white, took refuge in the mountains and were heard of never more.

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* *Historical Magazine.* Boston; vol. IV, page 65. See also in *Nouvelles Annales de Voyage,* 1856, tom. CLI, pp. 6–12.

† *Travels in Mexico, South America,* &c., by G. T. Vigne. London, 1863; vol. I, page 77.

‡ *A Ride Across a Continent,* by Frederick Boyle. London, 1868; page xx of preface.

§ *The Naturalist in Nicaragua,* by Thomas Belt. London, 1874; page 38.

‖ *American Philosophical Society Proceedings.* Phila.; vol. 14, page 483.

A Guatuso boy who lived for awhile at Alajulla was very sullen, and neither coaxing nor threats could induce him to answer questions in regard to the language of his people.

Mr. Gabb said that lately the rubber men had ascended the river in their boats to a point within three days' walk of Las Cruces, on the Pacific side of the Cordillera, the once fearless warriors having tired of the game of bows and arrows against buckshot and bullets.

The list of authors who have had something to say about these Indians is quite extensive, but I will give extracts from only one more—the first to allude to white Indians on the Isthmus. Speaking of occasional specimens, Wafer says: "They are white and there are of them of both sexes; yet there are but few of them in comparison of the copper colored, possibly but one to two or three hundred. They differ from the other Indians chiefly in respect of color." "Rather a milk-white, lighter than the color of any European, and much like that of a white horse." "Their bodies are beset all over with a fine short milk-white down." "Their eyebrows are milk-white also, and so is the hair of their heads, and very fine withal."* He reported them smaller and less strong than other Indians, and sluggish during the day, but skipping through the forest as fast by moonlight as others did by daylight.

In late years the rubber hunters have ascended the river and roamed the country, robbing and shooting until the formerly courageous Guatusos seem utterly cowed. The writer of this note saw two in Nicaragua in 1877. They were rather darker than the average Indian. One of them, a boy at Castillo Viejo, was decidedly intelligent, and from him were obtained a number of words of his mother tongue, a list of which was afterwards sent to Mr. Gabb.

Don Leon Fernandez started on his expedition in April, 1882, and finally settled the question. And now we may look for an early and satisfactory account of habits, &c., which have probably been preserved nearly as they were when Columbus made his discovery.

Mr. Squier thought that as natives of Ometepe and Solentiname of Aztec stock, were taken as interpreters on the various expeditions from Nicaragua, the Guatusos would probably prove to be of kindred race; a belief which was strengthened by the fact that the captured Sambos were understood by the Indians of Esparza, who, if not themselves Nahuatls, had settlements of that people in their neighborhood.

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* *A New Voyage and Description of the Isthmus of America*, by Lionel Wafer. London, 1699; page 134.

During five winters spent in the interior of Central America, the writer of this note did not see an Albino among the Indians.

Torquemada, in giving the traditions of the wanderings of the Cholutecos or Chorotegas in Central America, says that one party left the main body and reached the Atlantic. After following the coast of Nicaragua and Costa Rica, they turned back across country in search of the fresh water sea (Lake Nicaragua), of which they had heard so much.* Possibly this party left settlers in the region of the Rio Frio. However, light will soon be thrown on the subject by the study of their language now prosecuted by Señor Fernandez.†

ANCIENT REMAINS IN WHITE RIVER CAÑON.

By R. T. Bron, M. D., *of Camp Apache, Arizona.*

Since writing the description of the ruins in White River Cañon in 1878, other discoveries have been made, an account of which follows.

In the autumn of 1878, two burial-places were discovered, one near the ruins at the mouth of the cañon, about three miles down the stream from Camp J. A. Rucker. This cemetery consisted of one hundred or more tumuli of stones varying in height from one foot to three feet, and scattered irregularly along a small valley.

Above the ruins at Camp Rucker, about three-fourths of a mile, the second cemetery is to be seen on the left bank of White River. This burial-place is situated on a bluff about 60 feet above the bed of the stream. It was covered with a growth of pines, some of which are over 18 inches in diameter and many of them are growing out of the mounds. It was in this last-named cemetery that an excavation was made in the largest mound, supposed to contain the remains of some notable person. The length of the structure was about 15 feet, the breadth 8 or 10 feet, and the height 4 feet. It was formed of cobble-stones thrown together. After the stones were removed an excavation was made 4 feet deep into the soil. During the digging, at a depth of 18 inches, bits of broken pottery were found, but no bones. Growing out of this mound was a large pine tree, 4 feet in girth. In the immediate neighborhood of this mound the piles were larger than at other places.

Two or three smaller mounds near the mouth of the cañon were examined, and fragments of pottery were taken from each, but no bones or any relics. The cemetery in the cañon seems to have belonged to the three settlements, as it is almost equidistant from each, about half a mile. The one in the valley at the mouth of the cañon must also have belonged to the two or three settlements in its vicinity.

The remains of buildings are much more numerous than was indicated in my last annual communication. On careful search they were found to be scattered over more than 600 acres. They are not close together or uniformly distributed, but in separate groups. Large quantities of broken pottery are scattered around the foundations, some of it very prettily marked. The foundations are similar to those previously described. Rows of upright undressed stones, metates, and a few mortars were discovered. One of the mortars, near a small stream, had been hollowed out in a shelf of solid rock and was 300 feet distant from the remains of buildings.

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* *Monarquia Indiana*, by Juan de Torquemada. Madrid, 1723; tom. 1, page 333.

† Students interested in this and neighboring tribes will do well to consult Hubert H. Bancroft, *Native Races of the Pacific States*, page 747, *et seq.;* Wagner & Scherzer, *Costa Rica*, &c., and especially Benzoni, who gives an excellent account of the expedition of Gutierrez.

Judging from the pottery found in the tumuli, the people must have cremated their dead and buried the ashes in urns without any of their trinkets or other property. The large mound explored certainly had not been disturbed, and yet revealed no relics.

The Apache Indians, who have inhabited this region since the coming of the Spaniards, do not cremate the dead but bury in secluded places, and singly; they endeavor to remove all traces of the interment.

In giving the number of the mounds I have not over-estimated, for doubtless a careful search would reveal many more. Some of them are quite small, not containing more than a ton of stone.

MOUNDS IN HENRY COUNTY, IOWA.

By GEORGE C. VAN ALLEN, *of Mount Pleasant, Iowa.*

The following is a description of three Indian mounds located on Section 34, Township 72, Range 7 West, in Henry County, Iowa. The hill is about 1,000 feet long, and 300 feet wide from the base on the east to the fence on the west, and is about 120 feet above the level of the cornfield. Major Bereman, of this place, visited these mounds in June, and from one took out a quantity of bones, teeth, and charcoal. Some of the bones were charred and some sticks only partly burned. There seemed to be no order in the burial. The bones were nearly in a heap, and showed that more than one person had been burned and buried there. On July 20th a small party visited the place, took the measurements, and made some further excavations, but found nothing beyond some pieces of soft bone, a few bits of charred wood, and a pinkish-white arrow-head. No stones were found that seemed to us to have been arranged in any order, but a few were scattered at random throughout the mound. No. 1 is 50 feet north and south by 41 feet east and west; No. 2 is 43 feet north and south by 49 feet east and west; No. 3 is 40 feet north and south by 40 feet east and west. The distances from center to center are 107 feet and 50 feet. The height is from 4½ to 5 feet at the center. South of No. 3 are the remains of two mounds begun, about one foot deep at the center.

MOUNDS IN CARROLL COUNTY, ILLINOIS.

By JAMES M. WILLIAMSON, *of Thomson, Ill.*

In the town of York, Carroll County, Illinois, is a group of five very remarkable mounds. They are situated on the bluffs, 300 feet above the bottom-lands on the east side of the Mississippi River, from which they are distant about 2½ miles. They are built upon a high ridge of ground running in a due line from southwest to northeast. The first mound on the southwest is about 50 feet in diameter, and they grow smaller until the last one of them is only 10 feet across.

In September, 1882, I procured help and opened the first one by digging a trench directly through, beginning on a level with the base of the mound. After trenching about 8 feet we came to some fragments of burned clay, the pieces being as hard as burned brick, and resembling it very much in color. On digging in a little farther we came to fragments of rotten bone and teeth, but soon met with other bones in a better state of preservation. Digging in still farther we presently came to a perfect charnel-house of bones, most of them well preserved. We took them out as carefully as we could, and procured twenty-two crania, some of them very large indeed, and many of them in a good state of preservation and well shaped. All the other bones were in a fine state of preservation, and I have no doubt that this mound yet contains the skeletons of one hundred or more of the ancient mound builders of Carroll County.

The next mound opened was the last of the five on the northeast end of the ridge and is the smallest of the number. In this, at the depth of 6½ feet, we came upon another mound or cist of burned clay, 3½ feet wide at the base, 7½ feet long, and 20 inches high, this being so hard that it was almost impossible to penetrate it; but by slow work we tore it to pieces and found that it contained the remains of a body which had been burned. I brought away many of the bones; they are charred and very hard. Fragments of the skull are as tough as the thickest pottery. Over this mound of burned clay were ashes to the depth of nearly two inches, intermixed with charcoal. The body had evidently been laid on the surface of the ground, and the clay packed around and over it, after which the fires were kindled. This inside mound could have been taken out whole if we had exercised forethought. The other three mounds I have not opened yet, but shall do so in early spring. I expect from them some rich developments; they are all covered with heavy timber and hard to get at, as many of the roots from the oaks penetrate the skulls. Inside of the burned cist I found many fragments of pottery and flint implements, convincing me that the class of mound-builders inhabiting Northern Illinois broke all their implements, utensils, ornaments, &c., at the time of burying their owners, for in all my mound opening in this section I have never found a whole piece of pottery and but few whole stone implements or ornaments, but vast quantities of broken ones.

MOUNDS OF THE MISSISSIPPI BOTTOM, ILLINOIS.

By WM. McADAMS, JR., *of Otterville, Ill.*

The first exploration to be described relates to two remarkable mounds the first of which is on the Illinois River bottom, 15 miles from the mouth. It is oval in outline, 175 feet long and 50 feet wide on the level top, the sides sloping gradually down to the bottom. At the depth of 16 feet we came to a basin of clay filled with clean white sand. This basin was 25 or 30 feet long, and 20 wide. Covered up in the sand was a wagon-load of raw material for stone implements, flints, quartz, chalcedony, jasper, some of these in large pieces and very fine. The flint was from broken nodules, three of which, weighing from 20 to 40 pounds, were entire. These flint nodules were white without and dark brown within, like the flint nodules in the chalk. Some of the material was blocked out for implements. Lying on the sand were three large sea-shell vessels holding two quarts each. At the north end of the basin were found two skeletons in a sitting posture on the sand. The one on the east was that of an old man, judging from the teeth and obliteration of the sutures of the skull. The skeleton at his side was that of a young woman with beautiful even teeth. Around the neck of the old man was a string of shell beads of curious form, the perforation not going entirely through the bead, but out laterally. A few beads were scattered around. On the old man's breast was a circular plate of copper, about 4 inches across, also an ornament of copper like a large sleeve-button or spool 2 inches across the disks. These were much corroded. At the left side of the old man lay a beautiful pipe of mottled catlinite in form resembling many figured from the mounds, the curved base forming the stem. The skull, which I was very anxious to preserve, was broken, but the upper portion was saved. There were ashes and evidences of fire around the basin, indicating that fire had been used in the funeral ceremonies.

The second was a remarkable mound previously unexplored, situated on the Mississippi bluff in Calhoun County, Illinois. It was not a large mound, being only about 25 or 30 feet across the top, and 3 feet high. The bones found in it were very old and much decayed, and there seemed to be ten or twelve bodies buried in it. From this mound were taken seven ceremonial axes. They are of porphyritic granite, and are 5 to 6 inches long. There were four of the regular axe pattern, and two with narrow wings on the side of the central column, and one with jags at the two ends, like feet. One is of quartz and the other two are of a variety of quartzite. The lines on them are straight and true, the perforation passing through the center. They are very smooth and highly polished. Four copper axes of the celt pattern were found, plainly showing that they were hammered out from native ore. They are somewhat corroded. Three spear-points, with notched bases 6 inches long, were also unearthed, two of white jasper and one of red.

In addition to these our find included thirty-five chipped implements of white chert, varying from 8 to 10 inches in length, three polished axes, a plummet, and a stone tube. It is quite uncommon to find axes in a mound. These were taken from the base of the mound, There were no beads, shells, pipes, or ornaments found.

The country about the mouth of the Illinois and Missouri River is a good locality for mound exploration, especially on the highlands, but those in the bottoms are much the richest in relics. Fifteen miles from the mouth of the Illinois River is a group of six mounds in the river bottom; the largest of these was explored by the writer, and a pipe, copper ornaments, shells, &c., recovered. A ceremonial ax, however, was taken from a mound on the highland. On the Illinois River bottom, 35 or 40 miles from its mouth, is another group of eleven mounds, which are larger than those of the first group. Arrangements have been made with the owner of the field, and digging in them will soon commence. Some of the most promising mounds, however, are within a day's drive of Otterville, on the American bottom, between Alton and Saint Louis. Some valuable relics have been obtained here, yet very few, if any, of these large mounds have been explored.

The mounds, group No. 1, described below are situated on the Illinois River, 40 miles from its mouth. They are ten in number, and are in the lowlands or bottom, just beneath a precipitous bluff and near the river bank.

An excavation was made in No. 8, 13 feet deep, which revealed ashes in considerable quantity, alongside of which was an arch of flat stone covering a skeleton not very well preserved. The skull was broken and lying on a thin shingle-like piece of cedar, colored green with copper. Some of the bones were green also, but no copper implements were found, they being entirely oxidized. Nearly a quart of shell-beads, some large, others small, were found at the head as well as at the feet of the skeleton. An excavation in No. 7 to the depth of 13 feet revealed nothing. No. 4 is a conical mound, flat on top with a depression in the center. At the depth of 16 feet two crumbling skeletons were imbedded in a light-colored marly earth, showing marks of stratification, as if water had been used in its deposition. The white and dark colored laminæ, which I have not before seen in a mound, were not half an inch in thickness. The same stratified earth was found near the skeleton in No. 8. No relics of any kind except the human bones occurred in mound No. 4.

No. 2 is a double mound much lower in the middle, and seeming to be two mounds joined together. In this an excavation was made 18 feet deep, and tunnels carried under a good part of the mound, but nothing of value was found except burned stones, some ashes, and a few river shells. The mounds were very hard, and the excavations were made as we descended. Yet this long search yielded little or nothing. The author camped among the mounds with five young men, but in spite of good tools the young men got discouraged, and further exploration was reluctantly postponed. The largest mound of the group, No. 1, is 20 feet high, and unexplored, as are the remainder of the group not mentioned.

In mound No. 8, about 7 or 8 feet below the surface we found two skeletons, apparently an intrusive burial. With one were some arrow-points and a piece of plumbago nearly an inch square. With the other skeleton was an earthen vessel broken and crushed.

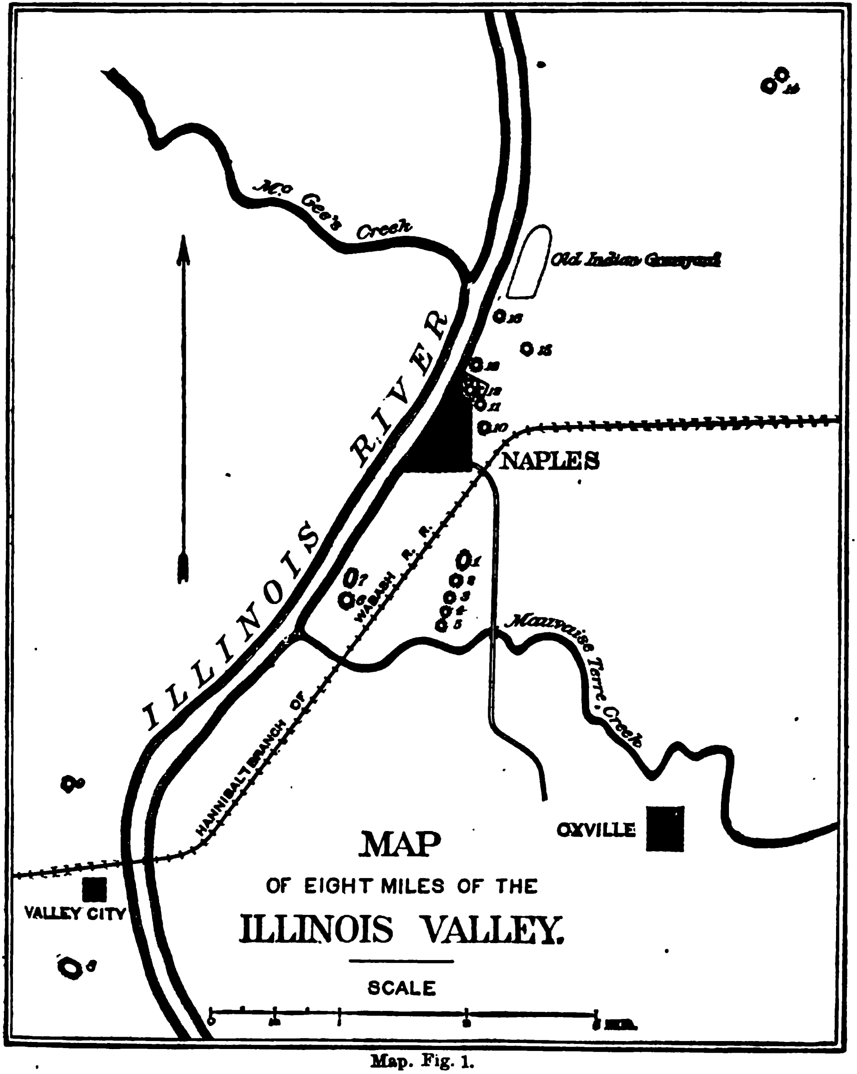
There are many mounds on the bluff adjacent to the group in the bottom. They are composed of earth and flat stones, and from one of them were obtained several perfect skulls, two of them very interesting on account of their peculiar shape, one broad and flat, the other narrow and long. From this mound was also obtained a fine piece of pottery in good preservation and perfect, excepting a small piece broken from the rim by the spade. It is different from any hitherto found. The vessel is of a dark, nearly black color, and seems to have been burned. It contained the inevitable spoon of shell from the adjacent stream. Near the vessel were secured flint implements, such as arrow-points, scrapers, bunts, knives, &c. The skull was broken in many pieces and beyond recovery. The flint and shell-spoon on one side have a siliceous, stony crust. This incrustation is also on the inside of the earthen vessel. From the fields in this vicinity were obtained a number of stone implements.

ABORIGINAL REMAINS NEAR NAPLES, ILL.

By JOHN G. HENDERSON, *of Winchester, Ill.*

A number of years ago Dr. Clark Roberts, of Winchester, Ill., had in his possession some singular pipes, which upon examination proved to be relics of the mound-builders. This, however, is a rather unfortunate title, as the history of nearly all savage races shows them to have been mound-builders. The same locality, by disease, famine, emigration, or war, may have been depopulated and again repeopled by other races, each of which in its turn may have erected mounds for religious purposes, as sites for temples or dwellings, points of observation or monuments over dead heroes. The word *mound-builder*, therefore, is calculated to lead to error by the implication that the habit of mound-building was peculiar to one prehistoric race, and that all the mounds of the great valley of the Mississippi are relics of one lost and forgotten people. In this paper the term *mound-builder* is applied to no particular race or nation, but to those who in ancient times occupied the Mississippi Valley, and there erected earthworks of any kind.

As the bulk of all that is known of the ancient inhabitants of this valley, especially of their curious and beautiful pipe-sculpture, was obtained by Squier and Davis from the mounds of Ohio, the importance of the discovery of similar articles on the banks of the Illinois River, the ancient Houkiki of the Algonkins, was fully appreciated by the writer, and Dr. Roberts kindly placed them at his disposal, giving all the information he could relative to them. The relics were obtained from a mound at Naples, Ill., where several years ago the writer resided and heard of the finding of these relics, especially the turtle-pipe. Dr. Roberts's courtesy determined at once a visit to the place in order to examine carefully the character of the mound, and to find anything that had been overlooked or thrown aside by the parties who first explored it. Accordingly, in February, 1876, in company with Mr. Merrill, the author visited the spot with the necessary implements for making a thorough examination. On a sand ridge, about one mile southeast of Naples and about three-quarters of a mile from the river,



Map. Fig. 1.

are five mounds, represented in the accompanying map, Nos. 1, 2, 3, 4, 5.

The river bed is near the center of the space between the bluffs or highlands, which are at this place 7 or 8 miles apart.

The following figure shows the relative position of the bluffs, river bottom, river bed, and sand-ridge on which the mounds are located:

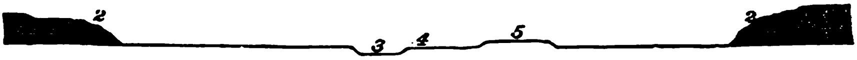


FIG. 2. Section of bluffs, &c., on Illinois River.

Nos. 2 2 represent the bluffs capped with *loess;* 3, the river bed, and 5 the sand ridge. This ridge is between a fourth of a mile and half a mile in width, about 30 feet higher than the level lands on either side, and runs a little east of north, parallel with the river. The mounds are nearly parallel with the ridge. The one farthest to the north, No. 1 (Fig. 1), is a regular oval, 132 feet long, 98 feet wide, and about 10 feet high. It was, no doubt, originally much higher, as it has been plowed over for years, and the top is composed of sand. Mound No. 2 is the one from which the pipes and other relics referred to were taken. This one, and Nos. 3 and 4, are covered with a small growth of hickory and oak trees. No. 2 is 86 feet in diameter and about 11 feet high. No. 3 is 90 feet in diameter and 11 feet 4 inches high. No. 4 is 66 feet in diameter and about 4 feet 8 inches high. No. 5 is 50 feet in diameter and 3 feet 6 inches high. Mound No. 3 is composed of very hard ash-colored clay. No. 2, from which the pipes were taken, is shown in the following outline cut (Fig. 3), which represents its present condition:

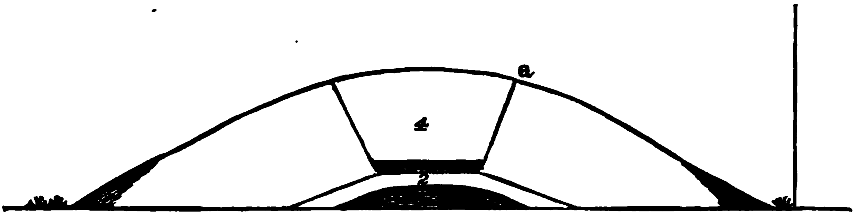


FIG. 3. Section of mound near Naples, Ill.

The inclosed space marked 4 represents the excavation made by former explorers. In the present exploration the diameter of the mound, 86 feet, was first obtained and then its height, using for this latter purpose a spirit-level and pole, as represented in the cut, placing the level on the margin of the excavation at *a*. Its height proving to be about 11 feet and the depth of the old excavation about 7 feet, 4 feet remained in order to reach the original surface. The removal of a large amount of forest leaves that had accumulated in the hole revealed for the first foot or more, soil that had tumbled down from the walls of the excavation. Next was encountered a stratum about 18 inches in thickness, composed of clay, black soil, and sand, in separate patches, indicated by 2 in the above cut. Below this was a layer of black soil, in which were found human bones, the head of one femur, the head and about 6 inches of the upper end of the other, one of the vertebræ, both clavicles, ribs, and other bones, but all very much decayed. Pieces of the skull were found, but so much decayed that only the outline was indicated on the earth. The size of the femur and other bones refuted the current tradition in the neighborhood that the original excavators found bones of giants in this mound. No ashes, charcoal, or any other indication of fire appeared. There was no altar. It seemed to have been simply a burial mound, the body having been placed on the ground and covered with a layer of black soil.

The first explorers found three pipes and two copper axes, of which two pipes and one copper ax were secured. The thorough excavation before mentioned prevented the determination of the exact position of the bones. The occurrence of the bones of only one individual led to the conclusion that the mound was erected as a memorial over the remains of a single chieftain or hero.

The relics discovered in mound No. 2 are probably as fine specimens of carving as have ever been found anywhere belonging to that ancient people, and they are in no way injured by the action of fire. Three pipes and two copper axes were found in the mound at a depth of about 15 feet. The following cut represents one of the pipes, intended to resemble the raccoon (*Procyon lotor*).

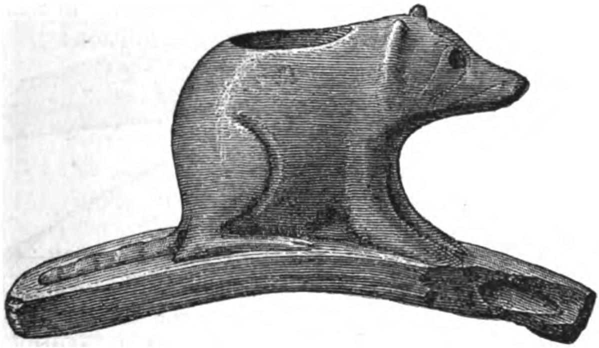


FIG. 4. Raccoon pipe, from Naples, Ill.

This raccoon pipe is made of very hard stone, and is polished as smooth as glass, and every feature of the animal is perfect. The bars on the tail, the claws, the position of the fore and hind feet are all correct; even the markings of the face are properly indicated by lines cut in the stone. But above all, the artist has caught the very expression of the animal which he was imitating.

Such artistic skill in the manipulation of the hardest and most intractable material into beautiful and graceful forms could only be obtained by long study and patient toil.

One of the most remarkable things about this specimen remains to be described, for it is not shown in the cut. The native workman, for some reason, began drilling the hole for the stem at the rear end of the curved base, so that the nose of the animal would be *from* the smoker, but, by accident, the under side of the material chipped out. Too much labor had been expended on the specimen to throw it away. He therefore made a neat plug of the same material, stopped up the hole with it, and then drilled a hole, as is almost invariably the case, in the front end, so the animal would face the smoker. The right front corner of the curved base is broken off, the fracture beginning at the stem hole, and, it may be, that this other hole was an attempt to repair the pipe after it was broken, and that, when the artist chipped out the lower side of the hole, he gave up the work and plugged up the partially drilled hole. Whatever may have been his object this neatly fitted plug is another proof of the skill of the workman.

The other pipe taken from the same mound is no less perfect. It represents the common hard-shell turtle of the American rivers, as shown in Fig. 5.

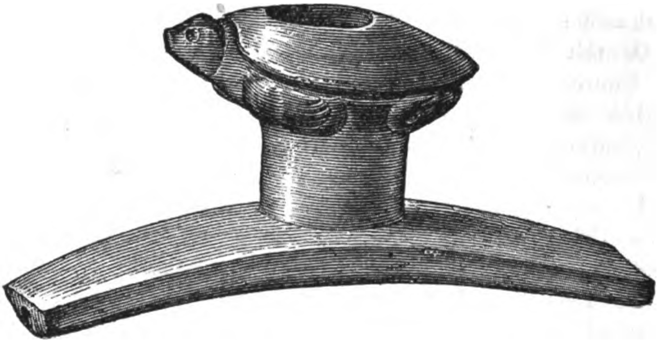


FIG. 5. Turtle pipe, from Naples, Ill.

The cut shows but faintly the beauty of this specimen—the nostrils, the head partially drawn back, the consequent fold of skin in the rear of the skull, the paddle-like feet, the claws, the tail folded around and against the body on the underside of the rear of the shell—all are perfect. In one of the eye-holes is a copper bead representing the eye ball, the other one being lost.

Professor Baird pronounces this turtle pipe to be made of catlinite. There has been some question whether any articles made of this substance have been found in any locality of undoubted antiquity; the shape, however, is precisely that of the other mound pipes. There is no question as to the antiquity of the specimen, however.

Judged from the figure on p. 423, of "*Flint Chips*" of a turtle pipe, found in the mounds of Ohio, by *Squier and Davis*, the Naples specimen is far superior to that one in fidelity to nature. The copper ax, Fig. 10

a and *b*, is 8⅝ inches long, 3⁶⁄₈ wide at the cutting edge, 2 inches wide at the top, and nine-sixteenths of an inch thick. It is made of pure copper. On one side the salts of the copper have preserved the cloth that lay against it.* The warp and woof, Fig 10 *c*, are distinctly marked. On the other side of the ax are preserved, in the same manner, feathers over the whole surface. This feather cloth was extensively manufactured by the Red Indians of two hundred years ago, but is now, like the manufacture of pottery, to most tribes a lost art.

For the manufacture of textile fabrics the aborigines used the inner bark of the mulberry tree (*Morus rubra*), cedar (*Juniperus Virginiana*), cypress (*Taxodium distichum*), red elm (slippery elm) (*Ulmus fulva*), the bass-wood (*Tilia Americana*), the papaw (*Asimina triloba*), and the outer bark of the Southern cane (*Arundinaria macrosperma*). The Southern Indians used the silk plant (*Apocynum canabinum*), while the California Indians manufactured their textile fabrics of *Agave Americana*. The natives of North America also wove the hair of the buffalo, the wolf, the dog, the brown lynx, and Virginia opossum (*Didelphys Virginianus*).

It is difficult to determine whether the threads on this ax are of bark or wool, though they seem to be the latter. In the Mitchell mound, in Madison County, Illinois, specimens of cloth were found of both materials, while the size of the mound, copper implements, and contents generally, indicated that it was of great antiquity.† In no one of the instances, except in the Mitchell mound, is there any trace of feather cloth. The reverse side of this copper ax is covered with the imprint of feathers. The body, no doubt, was wrapped in a bark mantle, one side of which was covered with feathers in the style in which the Indians of the Mississippi Valley manufactured feather cloth.

Out of hundreds of references on the subject the following are selected as probably throwing some light on the manner in which the tenant of this mound was clothed for his final rest.

Jones' *Southern Indians*, pp. 84, 85; Hayward's *Tennessee*, vol. 11, p. 163; *Archæologia Americana*, vol. 1, p. 303; Bradford's *Amer. Antiquities*, p. 30.

Other mound pipes have been found in the vicinity of Naples, and among the number that shown in Fig. 6.

Of this pipe Dr. Charles Rau says: "It is certainly the finest mound pipe thus far known. I have handled a hundred times the mound pipes of the Squier and Davis collection (now in the Blackmore Museum, Salisbury, England), but none of them equaled the specimen in question. Not having been exposed to the action of fire like the Ohio pipes, it has suffered no damage whatever, and is as perfect as on the day when it was made." Certainly a relic so highly spoken of by such competent authority justifies all the information relative to it which could be obtained.

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* See Jones' *Southern Indians*, p. 225; S. S. Lyon, *Smithson. Rep.*, 1870, p. 399; Foster, *Prehistoric Races*, p. 223.

† Upon this point consult *Flint Chips*, p. 420; Lapham's *Antiquities of Wisconsin*, p. 47.

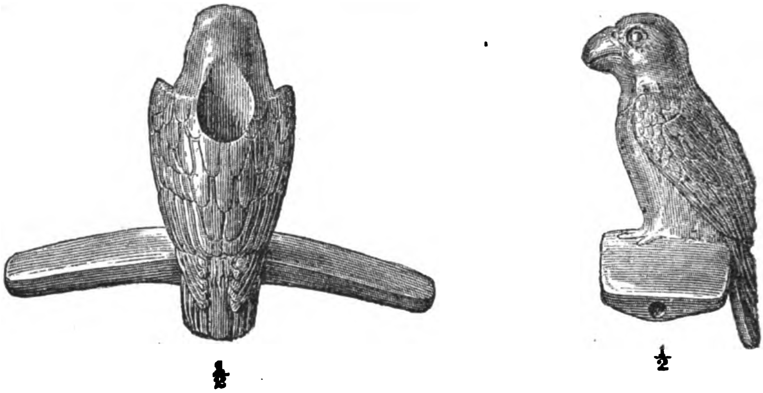


FIG. 6. Eagle pipe, from Naples, Ill.

On the right bank of the Illinois River, about 300 yards below Griggsville Landing, rises a lofty bluff fully 300 feet above the level of the river. On the summit is a beautiful, oval mound, 150 feet long, 92 feet wide in the middle, and 25 or 30 feet high. The following outline, Fig. 7, will give an idea of its appearance.

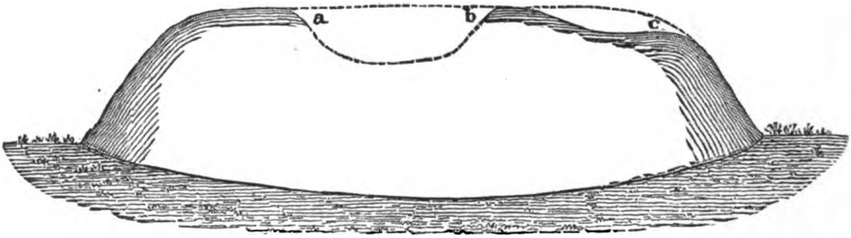


FIG. 7. Large oval mound, near Naples, Ill.

Daniel Burns, John W. Windsor, and others, about forty years ago, were engaged in digging a grave on this mound, when the spade turned out a stone bowl about 6 inches in diameter across the top and about 4 inches deep. Deposited in the bowl was found the eagle pipe, another bird pipe, a frog pipe, and a copper gouge about 6 inches in length. This locality has afforded many valuable relics of prehistoric man, and it is a matter of regret that they did not fall into the hands of persons who knew or appreciated their scientific value.

Just south of the large mound above described, on the next point, are five circular mounds about 30 feet in diameter and 10 or 12 feet high. Indeed, within a radius of 5 miles from Naples there are at least fifty mounds, very few of which have ever been opened.

After the foregoing description of these mounds and the articles found in them was written, the Smithsonian Institution, in December, 1879, began a through exploration of them. On the 10th of December, Mr. Merrill and the writer, with six laborers began work on mound No. 3 of the plat. In 1876, we had started a trench on the northeast side of the mound, about 2 feet wide, intending to carry it to the center, but the hardness of the material and want of time compelled us to desist. A part of our men were put to work in this trench, and the others began to sink a shaft about 8 feet square in the center of the mound. The earth was so hard that it was impossible to use a spade or shovel except for throwing it out after loosening with the pick. When within about 18 inches of the original surface a whitish substance was encountered resembling ashes. This substance was in a layer several inches thick, about 2 feet wide, and 10 or 12 feet in length north and south. The workmen in the center of the excavation reached the red sand of the original surface and then began carefully to enlarge the hole to the size of our shaft. Shortly, upon the west side, the pick struck the elbow of a skeleton. The arm, slightly bent, was resting in a natural position by the side. Carefully removing the earth the whole length of the skeleton, we found that the bones were those of an aged man about 5 feet 8 inches in height. The body had been placed at full length on a small elevation of sand, the head a little to the west of south, both arms in a natural position, resting by his side. The bones were greatly decayed. The skull had been mashed flat and broken into a great many pieces by the weight of the earth above, so that several were lost. The porous ends of the leg bones were completely decayed so that they crumbled to dust on exposure to the air. The processes for

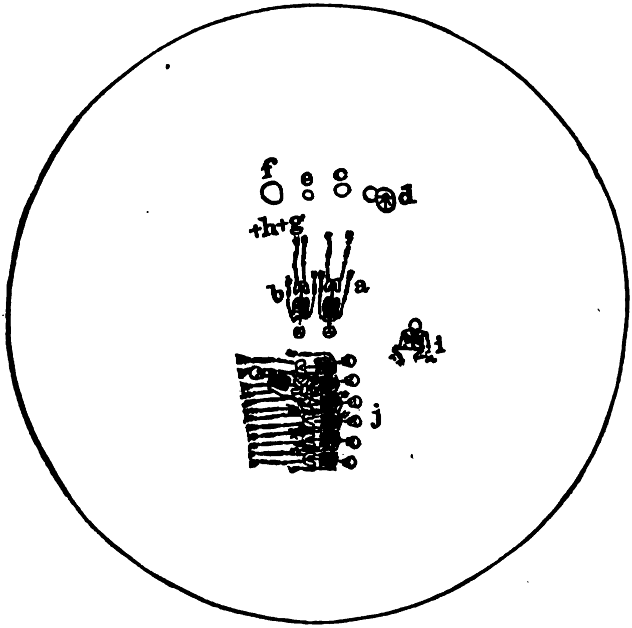
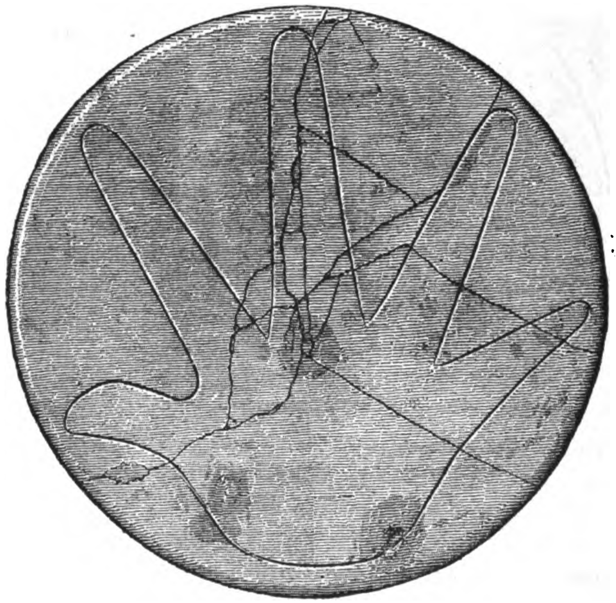


FIG. 8. Diagram of mound No. 3, near Naples, Ill.

a, male skeleton. *b*, female. *c*, two large, dark, chert nodules. *d*, circular plate with hand engraved on it. *e*, piece of galena. *f*, circular plate of mica. *g*, arrow-points and knives. *h*, copper ax. *i*, skeleton of woman (?). *j*, skeletons.

the attachment of ligaments indicate a man of great strength, while the tibias do not show any of the unusual flattening described by Mr. Henry Gillman, but are of the usual form, and the lower part of the humerus was not perforated in the manner described by the same author. The skull, from its great thickness, was capable of being restored by gluing the edges of the fragments together. This skull is represented in Fig. 24, *a* side view, *b* back; the top, in *a*, Fig. 26. Near this skeleton was another, lying in the same position as the first. The two bodies were placed side by side, and the latter, judging from the delicacy of the bones and teeth and the thinness of the skull, was that of a woman. In the preceding cut (Fig. 8) *a* and *b* represent the position of these skeletous. From the appearance of the teeth the woman was in the prime of life. Both of the bodies were buried in the mound with the flesh upon the bones, as every bone was found in its proper position. Near the feet of the male skeleton, at the point marked *c* in the cut, were found two large nodules of dark chert resembling the true flint of Europe. One of these was but slightly chipped, while the other had been split in two near the middle, and but one half deposited in the mound. This half nodule was lying face downward, and resting upon it and the ground was a remarkable specimen, which may be designated a "sun-symbol." It is a white stone, perfectly round, $12\frac{8}{12}$ inches in diameter, about one-half inch thick in the middle, and 1 inch upon the edges, slightly concave upon one side, and having upon the other a figure of a human hand. An idea of its appearance will be obtained from Fig. 9.



$\frac{1}{4}$

FIG. 9. "Sun-symbol," from mound near Naples, Ill.

The outlines of the hand are cut into the stone between an eighth and a sixteenth of an inch in depth, and then the inclosed space was cut down, or rubbed down, to about half the depth of the outlines. In this manner the hand was shown very distinctly. The edge at the thumb was resting on the ground, and at the little finger on the top of the chert nodule; thus the hand faced the east, the fingers pointing toward the south. The mass of superincumbent earth had broken this disk into several pieces, as there was when buried nothing under the middle to support it. To the left of this specimen and the nodules of chert were found a piece of galena weighing about 7½ pounds, and a circular piece of mica about 14 or 15 inches in diameter and about one-half inch thick.

Still further to the left, at the points marked *g* and *h* in the cut, were found two copper axes (Fig. 10, *a-b*, *d-e*), one weighing 7½ pounds and measuring 10½ inches in length and $4\frac{5}{12}$ in width at the cutting edge. Fig. 10, *c*, shows the texture of matting found around the copper axes.

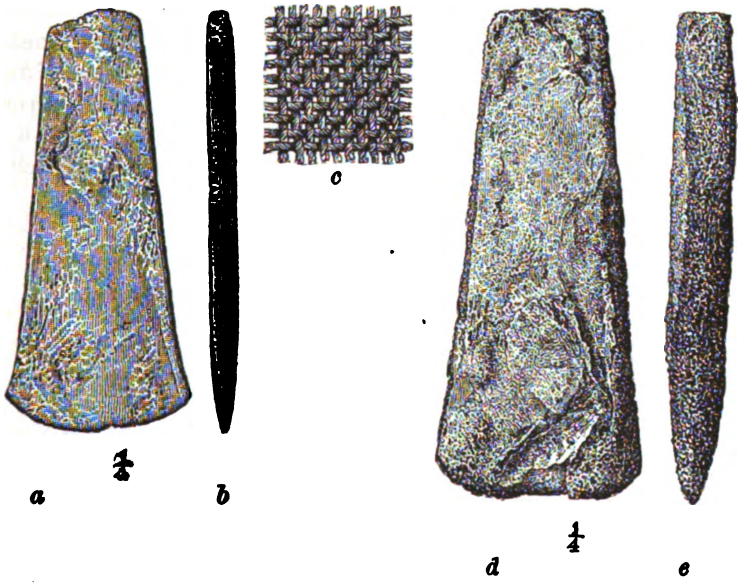


Fig. 10. Copper axes and matting, from mound near Naples, Ill.

With this ax were found four very fine arrow-heads (Fig. 12); two knives (Fig. 11 and Fig. 13, *b*); a finely worked spear-head (Fig. 13, *a*); and a very fine chipped ceremonial ornament (Fig. 14, *a*). The latter consists of a dark piece of chert, with two wings upon each side. The base and point are a modified form of the arrow-point.

There was also found a regular mound pipe made of a soft, white stone, very much decayed (Fig. 14 *b*.) The articles that were buried with these two persons are all represented in Figs. 11, 12, 13, and 14. A little southeast of the heads of these skeletons, at a distance of about 8 or 10 feet, at the point marked *i*, in Fig. 8, was found another skeleton in a sitting posture. Judging from the character of the bones and skull, this was probably a woman. Those bones which extended upward into the hard dirt are in an excellent state of preservation.

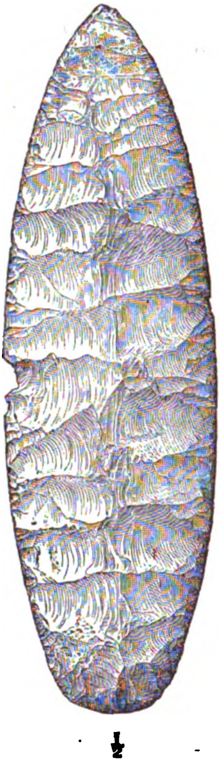


FIG. 11. Chipped knife, from mound near Naples, Ill.

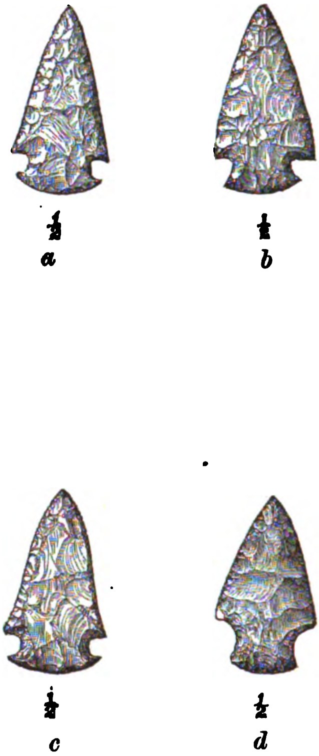


FIG. 12. Arrow-heads, from mound near Naples, Ill.

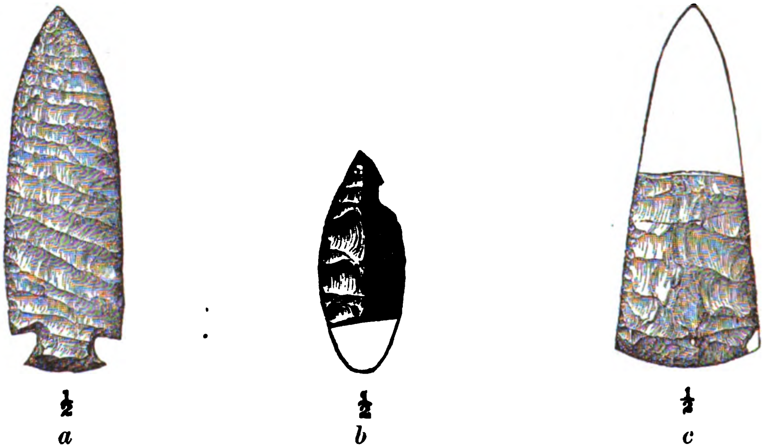
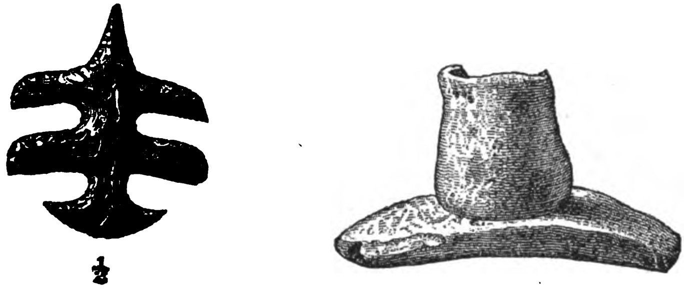


FIG. 13. Spear-head and knives, from mound near Naples, Ill.

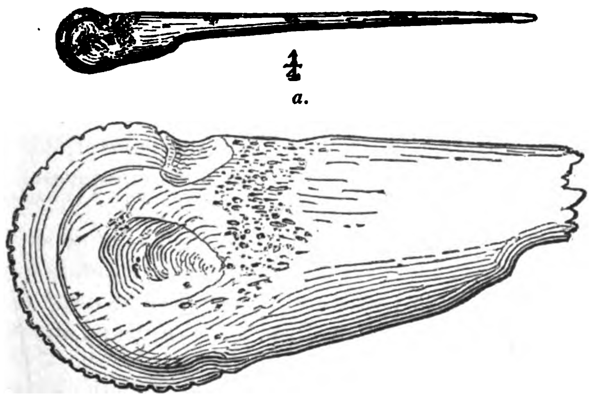
Those in contact with the sand were much decayed. The skull was broken to pieces; yet with patience it was restored. The bones, both of the skull and other parts of the skeleton, are clean and white—even the spongy ends of the femora and other bones being perfect.

Resting against the skull of this skeleton, with the point downwards, was found a fine wrought bone awl (Fig 15, *a*). Unfortunately the point was broken off, and it was probably deposited in the mound in the condition in which it was found. The portion recovered was probably placed in the hand of the person at the time of burial. This awl, together with five or six others of somewhat similar character found in the same mound, were all made of the metatarsal bones of the elk (*Cervus canadensis*). The one marked *a* in Fig 15, is $9\frac{5}{12}$ inches long, and was, when perfect, about 10 inches long. The metatarsal bone was split down through the center and the implement made of one of the halves. It is finely polished and is so well preserved that, with the point restored, it would be as useful an implement as it was the day it was manufactured. Around the circumference of the lower end are cut twenty-six notches.



a *b*, full size.

FIG. 14. Pipe and flaked ornament, from mound near Naples, Ill.



b. Head of same; full size.

FIG. 15. Bone awl, from mound near Naples Ill.

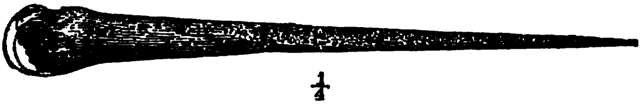


FIG. 16. Bone awl, from mound near Naples, Ill.

The part of the bone selected for these implements and the method of their manufacture are shown in Fig. 17, which represents the end of the metatarsal bone of the elk found in mound No. 6. A wedge was driven into the opening at the end, and the bone split in two along the middle line, each half afterward being converted into an implement by scraping and rubbing. Ten or twelve of these large bone awls were found in mound No. 1, sticking in the sand around a single skeleton. One of these is painted red and retains its brilliant color.

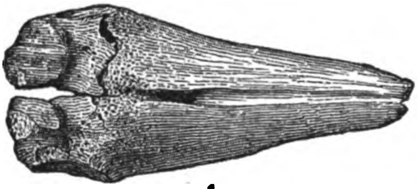

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FIG. 17. Bone of elk, from mound near Naples, Ill.

A small bone awl, represented in the following cut, half size, was found in mound No. 15.

½

FIG. 18. Bone awl, from mound near Naples, Ill.

Lying at right angles to the two skeletons already described in mound No. 3 were six or eight others, all with their feet to the west, except one, which was at least 15 inches below the surface sand, stretched out at full length, with the head to the northwest and feet to the southeast. No object of any kind was found with these skeletons. The bones were greatly decayed, and the skulls so far gone as to render the fragments almost worthless for any scientific purposes. The posterior portions had been much distorted, probably by the pressure of the earth. The fragmentary frontal of one bone is remarkable for the heavy superciliary ridges and retreating forehead, while another has the bone of the nose almost perfect, showing the feature to have been very prominent. The latter specimen is very similar in this particular to Fig. 65 in Foster's "Prehistoric Races." The comparison of the Dunleith mound skull with the Neanderthal skull in that figure seems to be very unfair to the former. By elevating the posterior portion of the fragment until the skull assumes a normal position, the difference between it and the Neanderthal specimen will be found to be very great.

No animal bones or fragments of them were found, and no evidence of any funeral feast or any funeral ceremony in which fire was used.

Mound No. 4 was opened by sinking a shaft about 8 feet square in the center several feet below the original surface. Nothing was found but a few fragmentary human bones greatly decayed and one fine, white chert arrow-point, represented in the following figure (half size):

Mound No. 5 was opened but nothing found. The earth in mound No. 4 was of the same character as that in No. 3.

The oval mound, No. 1, was explored in April, 1881 by beginning a trench at the north end and carrying it to the original surface and through to the south end. Lateral trenches were opened at intervals, and from these and the main one a complete exploration was made by tunneling.

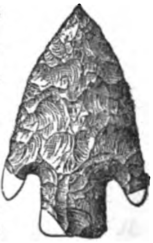
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FIG. 19. Chert arrow-head, from mound near Naples, Ill.

Near the center of the mound a single skeleton was found in a sitting position, and no objects were about it except a single sea-shell resting in the earth just over the head, and a number of the bone awls already described sticking in the sand around the skeleton. The individual had been seated upon the sand, these awls stuck around him in a circle, 4 or 5 inches in the sand, and the work of carrying dirt began. When the mound had been elevated about 6 inches above the head, the shell was laid on and the work continued. Although the many perfect bone implements found in this mound fully repaid the expense and labor of exploration, some disappointment was felt, since, from the size and beauty of outline of the mound, we expected some fine discoveries in the way of pipes, copper axes, &c. This mound was raised to about the height of 6 feet with hard clay, and then finished with sand. The skeleton was about 10 feet below the surface. The shell, a fine specimen of *Pyrula perversa* with the inner whorls removed, so as to be used for a drinking cup, is represented in the following figure:

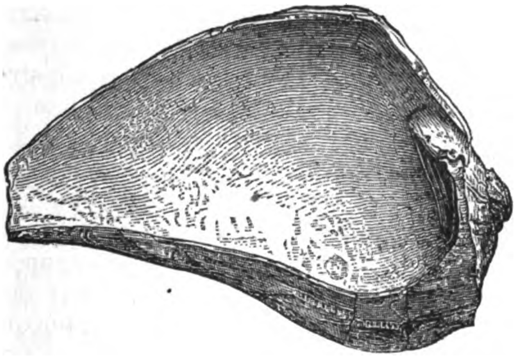

FIG. 20. Pyrula drinking-cup, from mound near Naples, Ill.

Mound No. 6, upon the river bank, is the finest in the vicinity. It is a truncated cone, about 136 feet in diameter at the base, 15 feet high, and 30 feet across the top. It is perfectly symmetrical, and from the success in the mounds upon the high ground great hopes were entertained of this, though the anticipations were not realized, yet what was found and the information we obtained fully paid the expense of opening the mound. The character of the earth was the same as that found in mound No. 3, but still much harder. More than once the workmen had to take their steel picks to the blacksmith shop and have them dressed. It was impossible to use the spade or shovel until the original surface was struck. These mounds were intended as enduring monuments to the dead, and for that reason were not built of the surface loam, or sand, which would soon be destroyed by washing, but of clay, and no doubt a part of the workmen engaged in their erection were employed in carrying water and pouring it on the mound as the work progressed. This, with the constant tramping, would account for the hardness of the material. At a depth of 7 or 8 feet, bits of rude pottery were encountered now and then all the way down to the base of the mound. None were found of sufficient size to indicate the form of the vessels, but, as they undoubtedly were made by the people who built this mound, they were carefully preserved. The material and appearance of these specimens are precisely those of specimens found in an old aboriginal cemetery on the bank of the river nearly opposite the mouth of McGee's Creek. (See plat, Fig. 1.) The outer edge of one pot was ornamented with slight notches made by pressing a stick or some other object into the soft clay. Judging from the fragment there was no other ornamentation on this vessel. Upon the inside, about three-fourths of an inch from the top, at intervals of about 1 inch, holes were made nearly through the vessel, not far enough, however, to cause any elevation of the corresponding portion upon the outer surface, as is the case in another fragment from this mound. The latter is ornamented with an oblong imprint similar to those in Fig. 22, *c*. Another piece from this mound shows a part of some figure traced upon the surface, but the fragment is too small to determine what it was. When near the base of this mound the men encountered a skeleton extended at full length with the head to the southeast. The bones were so greatly decayed that not even the fragments could be removed.

No moisture having ever penetrated to the base of this mound since its erection, the condition of these bones, as compared with those from mound No. 3, was looked upon as an indication of the greater age of the former. Even the molars were so decayed that they could be crushed between the finger and thumb. Yet the fallacy of such testimony, so often quoted by explorers, was fully demonstrated by finding in the sand below the base of this mound a perfect skull. A shaft about 10 feet square was sunk to the original surface, but, except the scraps of pottery and the skeleton referred to, nothing was found. The surface line was sharply defined as the mound was made of dark-colored clay, built on a plain of red sand. Upon encountering this red sand it was decided to explore the whole base of the mound by tunneling, which was done thoroughly by one of my men who was a coal-miner. With a little lamp upon his cap, and with short shovel and pick, he went everywhere in the sand under the base of the mound, at the same time chipping off from a foot to 18 inches of the clay roof over his head. By so doing it was found that at intervals of from 6 to 8 feet all over the base of the mound, for a space of 30 feet in diameter, there were pockets of ashes in the sand; that is, a hole about 2½ feet wide was scooped out to the depth of about 8 inches and filled with ashes. In these ash heaps were found numerous fragments of bone, many of them split in that peculiar manner practiced by savage man everywhere, for the purpose of obtaining the marrow. In these ash beds were also found a humerus of the wild turkey and about half of the skull of a skunk. In the sand near one of these ash beds was a human skull almost perfect but quite fragile. By the exercise of great care in handling it was washed and covered with a thin solution of glue. It is figured below, both side and back view, also from above, Figs. 24, *e* and *f*, and 26, *e*. There was also found a perfect awl or piercing instrument (Fig. 15, *b*), made of the left half of the right metatarsal bone of the elk (*Cervus Canadensis*). A part of the larger end crumbled a little after bringing it to the air. It is $12\frac{7}{12}$ inches long, and would have been an effective weapon to use in close combat. From a burial mound in Tennessee Dr. Jones took a needle, as he styles it, or piercing implement measuring 14 inches in length.* "It had" he states "been fashioned with great care from the tibia of the American deer, and was probably used for piercing leather." The larger number of the fragments of bone found in this Naples mound were those of the deer.

Mound No. 7 is within 60 feet of No. 6, on the west. It is now of an oblong shape, being longest from north to south, but this is due to the fact that the western half of it has been removed by the washing of the river. This mound was opened in one place to the original surface but nothing was found at the time, except fragments of bones split in the same manner as those in mound No. 6. Among these were fragments of the humerus, tibia, radius, ribs, and vertebra of the deer (*Cervus virginianus*. The humerus and femur of the wild turkey were found intact, also two femora of the beaver, the ulna of a large bird not identified, and the ulna of a small feline probably the skunk. All these fragments were found mixed with ashes and pieces of charcoal, indicating plainly that they are the remains of a feast. No fragmentary bones were met with, and nothing to indicate cannibalism. Of the other mounds of this vicinity only one was explored. This was No. 15, which is about 60 feet in diameter and 6 feet high. A shaft about 8 feet square was sunk

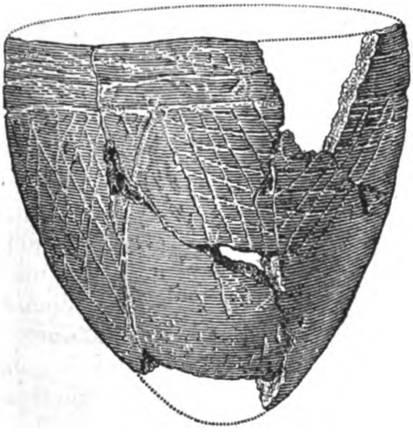

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FIG. 21. Earthen pot, from mound near Naples, Ill.

(* *Explorations of the Aboriginal Remains of Tennessee.* By Joseph Jones (*Smithsonian Contributions to Knowledge*, vol. XXII, p. 61.)

to the original level, developing the fact that it was a burial mound. The bones were so greatly decayed as to render it impossible to preserve even any fragments of the skulls. Large numbers of fragments of pottery were found, but no whole vessels. The material and many of the markings resemble those of specimens, already referred to, from the old cemetery on the margin of the river, distant about 300 yards. Judged from the fragments, the majority of the vessels would hold about 2½ gallons each. One, however, was not much larger than the half of a cocoanut-shell and of about the same shape, Fig. 21.

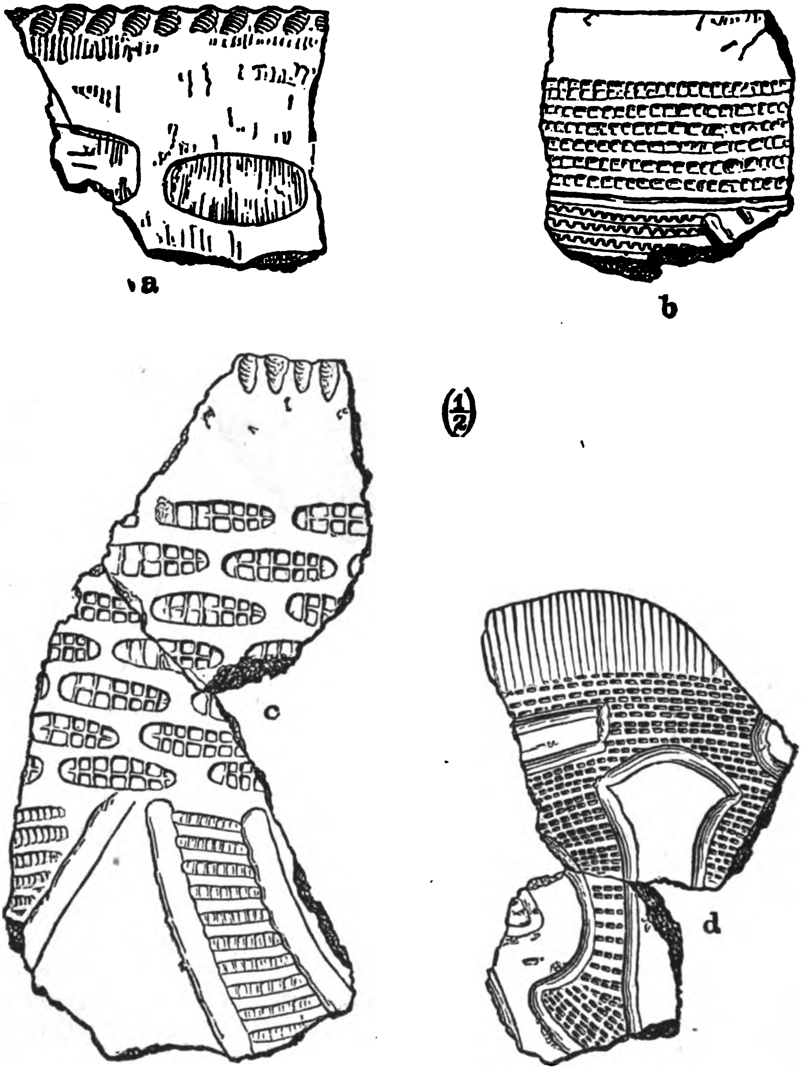

FIG. 22. Pottery fragments from mound near Naples, Ill.

It is of a dark color, about one-quarter of an inch thick, symmetrically made, and ornamented with lines about the sixteenth of an inch in depth, arranged as to form small lozenges about half an inch in length. The spaces so ornamented are four in number, large at the top and tapering to a point at the bottom, ending near the pointed end of the cup. The smooth intervening spaces form a four-pointed star, folded over the bottom of the cup, as shown in the cut. The preceding figure represents fragments of pottery from mound No. 15. The pieces *a* and *c* are each ornamented with figures stamped into the soft clay. One fragment from mound No. 6 was ornamented with a similar figure; also several fragments from the ancient cemetery above alluded to.

It is difficult to determine what was used to make this impression, but it must have been something of vegetable growth, serving as a natural stamp. From the character of the imprints on the fragment from mound No. 6, it seems that the stamp was somewhat pliable, as some of the figures seem distorted. The pottery must have been designedly broken and deposited in mound No. 15, as no whole vessels were found and not enough fragments of any one to restore it. From a careful examination of fragments from the mounds, as well as those from the ancient burial-place, it has been possible to determine the size and form of many of them. The most usual size held from 2½ to 3 gallons, and was shaped as in the accompanying cut, restored from fragments found in mound 15.

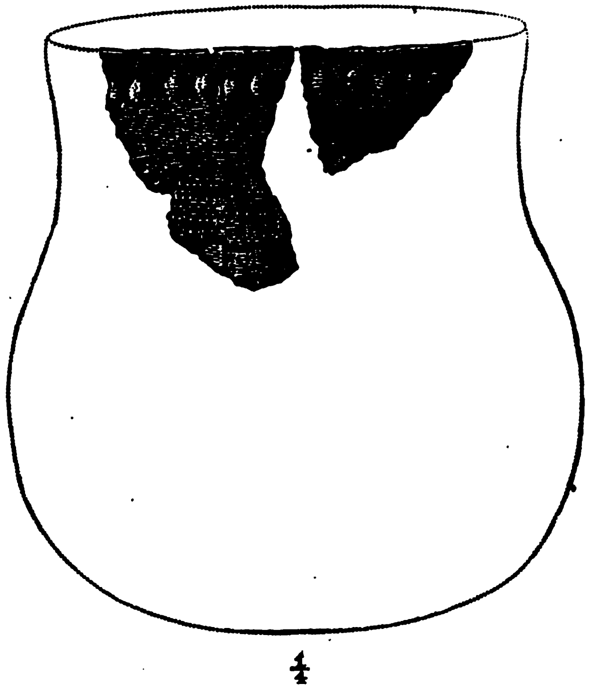

FIG. 23. Pottery, from mound near Naples, Ill.

Fragments from mound No. 6 measure at the rim, one 9 inches and another about 6, while those from mound 15 give the following: 10¾ inches, 10½, 9½, 8¾, and 6½; and specimens from the ancient burial-place give diameters of 20, 14¼, 12, 9½, 8, and 5 inches, respectively. The bead-like dots around the margin of Fig. 23 indicate holes punched from the inside of the vessel at intervals of about three-fourths of an inch, made with the end of a round stick about the size of a lead-pencil. The dots upon the outside indicate corresponding elevations made by the point of the stick being pushed nearly through. This method of ornamentation was found upon specimens in mounds Nos. 6 and 15, in specimens from the ancient cemetery, and in fragments found on an old village site, 3 miles west of Winchester.

The theory of a uniform typical skull-form for all the nations of the New World presented by Dr. Morton in his great work *Crania Americana*, so ably seconded by Dr. Nott in *Types of Mankind* indorsed by Humboldt, and for a time acquiesced in by American ethnologists, first challenged by Professor Retzius in 1859,* and again by Dr. Daniel Wilson in 1862,† may now be considered to have been completely overthrown.

It may be safely said that examples of all the various forms which the mania for skull classification has distinguished may be found among the various tribes of the New World yet living, as well as in crania exhumed from the ancient burial-places of extinct tribes.

Although the material for generalization is yet scanty, the same may be affirmed of the mound-builders and stone-grave race. The plan heretofore followed in attempting to establish a typical skull-form both for the modern Indian and the mound-builders is wholly unsatisfactory and fallacious. Let us assume an experiment exceeding in magnitude anything yet attempted in that line, for upon the theory adopted, the greater the number of skulls examined the more the probability that the typical form ascertained is the correct one; and if we find this experiment open to great sources of error which we have no means of eliminating, we may safely conclude that the attempts made upon a much smaller scale have failed to furnish us any reliable information. Let us take one thousand skulls, ten skulls from each of one hundred tribes scattered from Hudson's Bay to Patagonia. We tabulate all the various measurements, longitudinal, parietal, frontal, vertical, &c., and by this means strive to obtain a typical skull. It may be that not five of the whole number conform to this type, and it may be that each of these belonged to one tribe. In attempting thus to establish a typical skull-form for a hundred tribes we assume a fact which does not exist, viz, that there is an average uniformity in the skull-forms of the various hundred tribes, or, in other words, that the average variation of skull-forms is the same in all these tribes. Secondly, we assume that the ten skulls taken represent fairly the variations of skull-forms in the particular tribe. This may be true or it may not. For example, every skull obtained may, by accident, belong to the brachycephalic type, while the skulls of the tribe may be equally divided between that form and the dolichocephalic. With these facts before us examine any table of measurements yet made of American crania and calculate the chances of error. There are not in all the public and private collections fifty undoubted mound-builder skulls, assuming that the builders of the great mounds and earth-works were a different race from the modern Indian. With a view of ascertaining the probable number of such skulls in the country, in January, 1880, the author mailed a circular letter to a large number of private individuals and public institutions, about seventy in all, requesting answers to two questions:

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* *Smithsonian Report*, 1859, p. 264.

† *Ibid*, 1862, p. 240 *et seq.*

1st. How many genuine mound-builder skulls are in your collection?

2d. How many that are supposed to be mound-builder skulls?

In a very large majority of the cases the answer to even the second question was "not one!" while the exception was rare, indeed, where persons claimed to be in possession of skulls of the first character. The four greatest public collections are the *Academy of Science*, Philadelphia; the *Smithsonian Institution*, at Washington; the *Peabody Institute*, Cambridge; and the *Davenport Academy of Science*, in Iowa. In these public collections are many labeled mound-skulls, simply from the fact that they came from the base of a mound, without any reference to its size or other articles taken from it. In estimating the number of undoubted mound-skulls, those of this character are excluded. Assuming a difference in the race who built the great mounds and earth-works of the Mississippi Valley and the modern Indian, a skull taken from a mound of this character may belong to the one or the other. Applying the test suggested in the circular above alluded to, which is the best the nature of the subject will admit of, that is, "to only class as genuine those that are found in connection with other objects that unquestionably belonged to the mound-builders," the number of genuine mound-builder skulls is reduced by two-thirds.*

Dr. Foster fell into a grave error when he classed as "authentic skulls of the mound-builders" those obtained from low mounds on the banks of the Des Plaines River, of Illinois. These mounds were elevated only about "2½ feet above the surrounding plain," and no objects were found in the mounds which are looked upon as peculiar to the mound-builders. Yet he classes these skulls as genuine mound-builder remains, figures some of them in his work; and in the winter of 1869–1870 presented to the Chicago Academy of Sciences "the generalization as to the former existence on this continent of an anomalous race, characterized by a remarkably depressed forehead."*

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* Dr. J. F. Snyder, a gentleman who has devoted a great deal of thought to this subject, suggests that "this test appears very unsatisfactory, for the difficulty of distinguishing 'objects that unquestionably belonged to the so-called mound-builders' is necessarily as great as to distinguish their crania." The force of this criticism is admitted; yet if we find a skull at the base of a great mound, and with it copper axes, pipes with the peculiar curved base, and such articles as were found by Squier and Davis in the mounds of Ohio, we may safely assume that the mound was built by the same race that erected those of similar character in which similar articles were found.

Judge Force suggests that "Dr. Foster's argument is very good, but he failed in the first step; he failed to get crania of the mound-builders."†

Dr. E. H. Davis remarked before the American Ethnological Society in 1859, that "in more than one hundred mounds opened by Mr. Squier and himself, they had found only one or two skulls in good preservation."‡

The assumption of the existence of a typical mound-skull implies that there was one homogeneous race, or tribe, that built all the great mounds and earth-works everywhere in the Mississippi Valley, or that the mounds were the work of various tribes, and that the typical skull of each separate tribe was the typical skull of every other tribe. The first hypothesis is wholly untenable. The variation in form of these earth-works would indicate that they are the work of different peoples. The peculiar characteristic of the Ohio works is the great squares and circles nowhere else found of such magnitude or in such numbers; while that of Wisconsin is in the wonderful animal effigies, spread out like picture-writing upon a grand scale on the prairies and in the central and southern portions of the vast valley. These works culminated in great *teocalli*, such as the great mound at Cahokia and that of Seltzertown, in Mississippi. I know that it has generally been accepted without much investigation that the center of this widespread race was in Ohio, and that the wonderful animal mounds of Wisconsin were the work of the same people, built probably as a pastime as they went to and returned from the copper mines on Lake Superior. This is wholly unwarranted by the facts. Mound-building upon the scale of these great earth-works, anywhere in the Mississippi Valley, was a slow and laborious process. The extensive earth-works of Ohio were erected by a people who lived on them and about them. The same may be said of the animal mounds of Wisconsin. The erection of such magnificent works of art, considering the stage of the civilization of the workmen, far beyond the borders of their territory, where they would never be seen by members of their own tribe, except by those engaged in commerce or on the war-path, is incredible. The great burial mounds on the banks of the Illinois and other tributaries of the Mississippi contain the bones of those who lived in the vicinity, and the wonderful *teocalli* in the center and south were erected in the midst of the homes of their builders. The fact that the mounds of Ohio were first explored, and the result of that exploration given to the world in a magnificent volume by the Smithsonian Institution, is one of the reasons why that locality has been frequently spoken of as *the* great center of the population of the mound-builders. The fact is, it was *a* great center of an ancient population. Wisconsin was another great center of another population, while Southern Missouri was still another great center of a different population, judging them by the character of the mounds and the works of art found in them. Tennessee may be considered as another center of a distinct population; and we have no reason to believe that one of these was more densely populated than another.

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* *Prehistoric Races*, pp. 275, 282.

† *Indians of Ohio*, &c., p. 64.

‡ *Hist. Magazine*, vol. III, p. 264.

Having shown that belief in the existence of one uniform, homogeneous race with a common skull-form, all over the Mississippi Valley, is wholly untenable, in order to warrant us in still looking for the typical mound skull we must assume either absolute uniformity of forms belonging to each tribe, or uniformity in variation, and that, from one or the other of these causes, the typical skull of one tribe was the typical form of every other. The first of these latter hypotheses, absolute uniformity of skull-form, has never been found existing in a single tribe, and it would be a miracle to find, not only uniformity in a single tribe

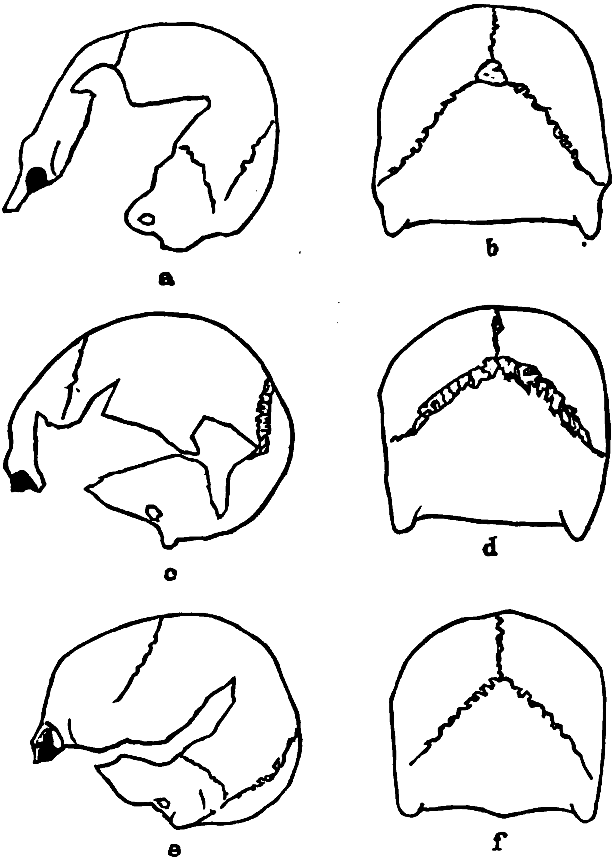

FIG. 24. Mound-builders' skulls, from mound near Naples, Ill.

of these ancient mound people, but that the same uniformity extended through all the various tribes. Compelled to abandon the idea of a single widespread people for whom we can assign a typical skull, and compelled to relinquish the idea of absolute uniformity of skull-forms in numerous tribes, we are driven to the only remaining hypothesis—that of uniformity in variation in the various tribes; and I think it can easily be shown that the probabilities of the existence of such fact are very slender.

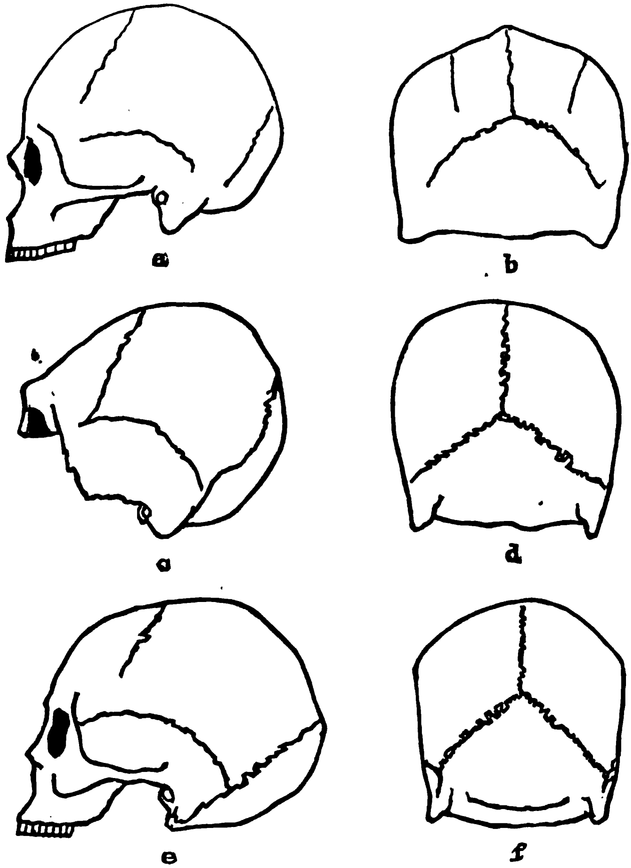

FIG. 25. Crania from mounds near Naples, Ill.

Lieut. W. H. Dall* has perfectly expressed my ideas in regard to variability of skull-forms, and the difficulties in attempting to establish typical forms.

This "factor of individual variation" is strikingly illustrated by the two skulls taken from mound No. 3, at Naples, the one a very brachycephalic and the other a dolichocephalic skull, undoubtedly of the same people who built the mounds, as there is not a possibility that either could have been an intrusive burial. These skulls are shown in Fig. 24, *a* and *c* side views, and *b* and *d* back views; and in Fig. 26, *a* and *c* top views.

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* *On succession in shell-heaps of the Aleutian Islands*, in *Contributions to North American Ethnology*, vol. 1, pp. 70, 71.

The vast difference between these two skulls can only be understood by an examination of them, and no better illustration could be found of the futility of attempting to establish a typical form for the mound-builders.

In figure 25, *a* is the skull of a modern Indian buried just below the surface in a mound in the town of Meredosia, 5 miles from Naples, and is only figured here for comparison with the others. It is a short, wide skull, and admirably corresponds with the ideal Indian skull of Dr.

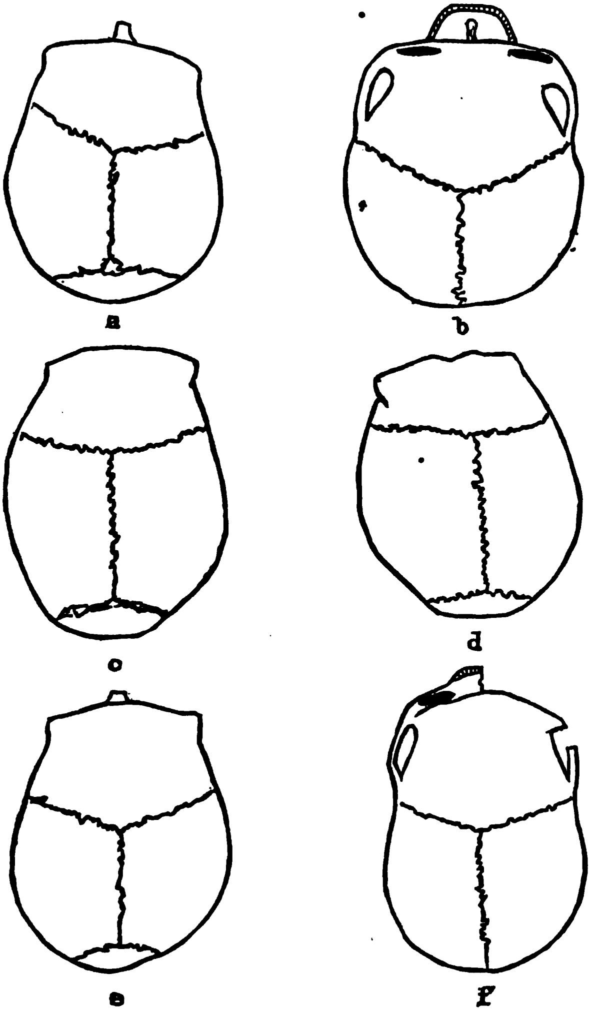

FIG. 26. Mound crania, from mounds near Naples, Ill.

Morton. *c* is a remarkably distorted skull from a low mound on the bluffs 3 miles west of Winchester. The cut accurately indicates the side view, but the distortion sideways cannot be shown by a figure. The top of this remarkable specimen is shown in Fig. 26, *d*.

It is not pretended that this skull belonged to the same people who built the Naples mounds. Indeed from the decayed condition of the Naples specimens, protected as they were from moisture, we may safely say that a skull buried at the same time only 3 feet below the surface would have completely disappeared. Any one who has ever made and tabulated the usual measurements of half a dozen skulls must have been conscious of the fact that these measurements are as inadequate as wood-cuts to indicate differences in forms instantly recognized by the eye. For example, exactly the same parietal diameter may exist in a skull perfectly symmetrical as in one greatly distorted; or again, exactly the same occipito-frontal circumference may exist in a low, dolichocephalic skull and a brachycephalic one with elevated vertex, or the horizontal circumference be identical in a round head and a long one. I have figured three undoubted mound skulls and three more modern ones, and below furnish a table of the most usual measurements, with but little expectation that those who read this article will get any clear idea of the vast difference in some of these skulls, differences which can only be appreciated by examination of the skulls themselves.

To show the great difference in a side view of two skulls, taken from the same mound, the outlines of both are given in the same cut, Fig. 27. The dotted line represents the skull marked No. 2, and the other outline, skull No. 1, both from mound No. 3. For the purpose of still further elucidating the variations in these forms, the following table of measurements of three of the Naples mound skulls and one skull of a modern Indian is appended, the latter taken by me from near the the surface of a mound in the town of Meredosia 6 miles north of Naples.

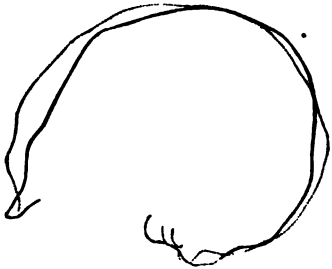

FIG. 27. Outlines of mound crania.

	L. D.	P. D.	V. D.	F. D.	I. M. A.	I. M. L.	O. F. A.	H. C.
Modern Indian	6.88	5.58	5.25	4.75	14.25	5.16	13.08	20.25
Mound-builder (mound No. 6)	6.66	5.05	5.16	4.75	13.66	5.16	13.16	19.75
Mound-builder (mound No. 8)	6.05	5.25	5.16	4.75	14.16	5.41	13.66	19.66
Mound-builder (mound No. 3)	7.008	5.05	5.41	5	14.16	5.008	14.008	20.58

Many writers have spoken of the soundness of teeth of the mound-builders. Dr. T. S. Sozinsky* says: "The dental profession was unknown to the mound-builders, and they had no need for it; for toothache and all such diseases were troubles with which they were but very little acquainted." Dr. Farquharson* mentions the invariable soundness of teeth in the remains found in the Davenport mounds. The fallacy of drawing general conclusions from insufficient data is well proven by such statements. A few mounds were opened in the vicinity of Kansas City, and all the teeth found were sound, and the general statement is at once made that diseased teeth were unknown to the mound-builders. Dr. J. J. R. Patrick, of Belleville, Ill., who has had a fine opportunity for observation, says: "It is the exception to find a sound set of teeth. - - - The marks of alveolar abscess are common; loss of molars and bicuspids are frequent, with complete absorption of the sockets."† The writer's observations, which have been limited, accord exactly with those of Dr. Patrick. The lower jaw belonging to skull No. 2, from mound No. 3, shows an alveolar abscess under the second molar upon the left side, and loss of all the molars upon the right, with complete absorption of the alveolar processes. The second molar upon the left was diseased, a cavity extending entirely through the crown. In this specimen there was no complete loss of teeth before death, but the second and third molars upon the right side are badly decayed, and while Dr. Sozinsky's statement, that "the dental profession was unknown to the mound-builders," probably was quite correct, yet the owner of these teeth could vouch for the fact that at least one of their number knew what it was to have the toothache. The teeth of all the specimens found are worn quite flat upon the crowns, and this remark applies to the cuspids and bicuspids of all the specimens found except one. Dr. Patrick, in the paper above quoted from, says he has but "two skulls in which the front teeth lap over each other; in all the other cases the masticating surface of the upper jaw fits perfectly that of the lower, and so with all the teeth that are not missing. The incisor teeth do not lap, but impinge on each other at their cutting edges like the molars, and are worn quite flat, so that when we look along the surface of mastication we perceive that it is almost a perfect plane." This is an exact description of nearly every specimen from these Naples mounds, there being but a single one (No. 154) in which the incisor teeth are chisel-shaped like those of our own race. This form of the front teeth is not peculiar to the mound-builders, but is characteristic of savage races generally. The disuse of the front teeth for the purpose of severing mouthfuls of food from the mass, consequent upon the use of the knife and fork, together with change of food, has materially modified the process of mastication and the form of the teeth.‡

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* "The teeth of the Mound-Builders." *Dental Cosmos*, vol. 20, p. 496.

From the authorities cited it will be found that the ancient Peruvians and Egyptians, the primitive men of Denmark and Great Britain were, and that modern savage races still are, characterized by this peculiar form of the front teeth, and from these facts in advance we might have foretold the form of those of the mound-builders.

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* *Smithsonian Report*, 1874, p. 363.

† *Dental Fallacies*, a paper read before the Missouri Dental Association by Dr. John J. R. Patrick, pp. 8, 9.

‡ Upon the teeth of savage races, see D'Orbigny; *L'Homme Américain*, vol. 1, p. 128; *Flint Chips*, p. 62, note; Morlot, in *Smithsonian Report*, 1860, pp. 312, 313; *Indigenous Races*, p. 297; Lubbock's *Prehistoric Times*, p. 538; Bancroft's *Native Races*, vol 1, pp. 25, 46, 163; Wilson's *Prehistoric Man*, 2d ed., pp. 454, 455.

Having fully described these mounds and their contents, so far as explored, it only remains to offer some general conclusions as to the character and habits of the people who built them. There is no evidence that the mounds numbered 1, 2, 3, 4, and 5 were built by the same people who erected Nos. 6 and 7; for, except the finding of bone awls similar in form, made from the metatarsal of the elk, there was nothing common to the two groups. It is true that Nos. 1, 2, 3, and 4 of the first group, No. 6, and probably 7, of the second, were all burial mounds, yet the funeral ceremonies, as indicated by Nos. 3 and 6, were wholly different. It is clear that one distinguished man of the tribe was buried in mound No. 3, and that the other persons, twelve or thirteen in number, were sacrificed to go with him to the land of souls. In a circle around his feet were placed the most valuable of his possessions, under the belief they would be of use to him; beside him was placed his wife; near him in a sitting posture his sister or some other near female relative, and at his head half a score of his most trusty attendants. Even the laborers assisting in the exploration seemed to understand that this man was the one important personage over whom this monument was erected. There were no broken or split animal bones, no charcoal, and nothing else to indicate a funeral feast. With the exception of the single bone awl, no object was found near any of the skeletons, except at the feet of the one named; and the skeleton of this one, and that of her alluded to as his wife, were deposited on a little hillock of sand, while those at their heads were apparently laid on and against its sloping sides. The bones and skull indicated a man of great age, which is confirmed by the character of the teeth, several of them being badly decayed, and in one place the alveolar processes completely absorbed. Again, the burial of the remarkable stone disk with the human hand inscribed upon it, an object requiring long and patient labor in its manufacture, also points to the importance of this personage.

As before remarked, the funeral rites practiced by the people who built mounds Nos. 3 and 6 seem to have been wholly different. In the latter case there is evidence of a great funeral feast upon the flesh of the deer, the elk, the wild-turkey, the skunk.*

In the use of fire and the careful deposit of the ashes in little pockets scooped out of the sand, there is no evidence that any of these Naples mound-builders were "an agricultural people." The weapons deposited with their dead are those used in war and the chase, and are very

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*Lawson (*Description of N. Carolina*, p. 197) says of the skunk: "The Indians love to eat their flesh, which has no manner of ill smell when the bladder is out." Mr. Comfort (*Smithsonian Report* 1871, p. 394) suggests relative to the skull of a skunk found in a mound by him, that it probably was attached to a medicine bag.

similar to those used by savage races everywhere. The finding of copper axes (Fig. 10), too, indicates no great advancement toward civilization, for there are more instances on record of articles of this metal found in the hands of the Indians than in the mounds. The fact is, but little copper has ever been found in the mounds, and it is absurd to contend that the few specimens met with show that the builders of the mounds habitually used copper implements and were the authors of all the prehistoric mining upon Lake Superior. A writer recently remarked in the *Virginia Gazette*, that "the mounds and old grave-yards and camp ing grounds of the prehistoric races of our country have been pretty well ransacked, and so far all the copper relics found in the United States put together would not weigh half a ton." Dr. Charles Rau, the best authority in matters relating to American archæology, in an admirable paper upon *Ancient Aboriginal Trade in North America*,* says: "The use of copper was comparatively limited, and cannot have exerted any marked influence on the material development of the natives." Neither does the fact that some textile fabric was manufactured by these people, as shown by the specimen adhering to the copper ax found in mound No. 2, indicate any advance beyond the aborigines of the New World at the date of the discovery. In a paper on *The Textile Fabrics of the Ancient Inhabitants of the Mississippi Valley*, read before the American Association at Boston last year, the author showed conclusively from historical sources that textile fabrics of some character were manufactured by the aborigines from the lakes to the Gulf at the period of first contact with civilized man, and that many of these fabrics (Fig. 10, *c*), especially those made by the village Indians of the Lower Mississippi, surpassed in quality any specimens yet taken from the mounds.

Fragments of bone, teeth, and horn from the mounds, the faithful representation of animals left us in the pipes of the mound-builders, and the immense animal mounds have enabled us partially to reconstruct the fauna of the period of the builders of the mounds. A careful examination of recorded facts enables us to present the following list:

Mastodon.(?)—Shown in sculptured pipes from Davenport mounds, and upon a tablet from a mound in same vicinity.[1] Represented in immense bas-relief upon prairies of Wisconsin. A tooth was found in stratum overlapping a mound in Missouri.[2]

Buffalo.—Professor Shaler[3] says that the buffalo was not here in the time of the mound-builders, but the spinous processes of this animal have been found in a mound in Dakota.[4] It is represented in the animal mounds of Wisconsin,[5] and the teeth of the buffalo have been found in the drift of Maine.[1] It is singular, however, that this animal is not represented in the sculptured mound pipes, yet the same remark applies to the moose, the porcupine, the rabbit, the skunk, and other animals, a part of which are known to have been familiar to the builders of some of the mounds.

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* *Smithsonian Report*, 1872, p. 350.

[1] *Proceedings Davenport Academy of Science*, Vol. XI, Plate II.

[2] *Eighth Annual Report Peabody Museum*, p. 45.

[3] *Amer. Naturalist*, vol. 4, p. 159.

[4] *Smithsonian Report*, 1871, p. 394.

[5] Lapham's *Antiquities of Wisconsin*, p. 69, and Plate XLV, No. 1.

Moose.—Perforated teeth from mound on Saint Clair River, Michigan.[2]

Elk.—Bone implements from mounds of Ohio,[3] and from mounds Nos. 1, 3, 6, and 15, Naples, Ill. The head of the elk is also faithfully represented in a sculptured pipe from Ohio mound.[4] Skull of elk found by Sidney S. Lyon in a mound in Union County, Kentucky.[5]

Deer.—Bones found by Prof. F. W. Putnam in a mound on the Wabash River, Indiana.[6] Bones found by the writer in mounds Nos. 6 and 7, Naples, Ill. Awls made from bone of deer found by Sidney S. Lyon in Union County, Kentucky.[7] Horn found in a mound at the same place.[8]

Bear.—Fragment (head) from sculptured pipe found in Ohio mounds.[9] Drilled teeth from same mounds.[10] Drilled teeth and radius from Illinois mound.[11] Bones found by Prof. F. W. Putnam in a mound on the Wabash, Indiana.[12]

Wolf.—Sculptured pipes from Ohio mounds.[13] Drilled teeth from same mounds.[14] Skull of prairie wolf in mound in Dakota.[15]

Dog.—Skull from mound in Illinois.[16]

Panther.—Fragment of pipe from Ohio mound,[17] also a pipe fromDavenport mound.[18] Teeth found in a mound in Kentucky.[19]

Wildcat.—Sculptured in Ohio pipes,[20] and drilled teeth from same mounds.[21]

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[1] *Amer. Naturalist*, vol. 1, p. 268, note, and Vol. 6, p. 98, note.

[2] *Sixth Annual Report, Peabody Museum*, p. 17.

[3] Squier and Davis, *Ancient Monuments*, p. 220, Fig. 119.

[4] Squier and Davis, *Ancient Monuments*, p. 257, Fig. 161.

[5] *Smithsonian Report*, 1870, p. 395.

[6] Foster's *Prehistoric Races*, pp. 137, 138.

[7] *Smithsonian Report*, 1870, p. 395.

[8] *Ibid*, p. 403.

[9] Squier and Davis, *Ancient Monuments, &c.*, p. 271. Fig. 189; *Flint Chips*, p. 430 Fig. 69.

[10] Squier and Davis, *Ancient Monuments*, p. 234, Fig. 131.

[11] *Second Annual Report Peabody Museum*, pp. 15, 16.

[12] Foster's *Prehistoric Races*, p. 137. Represented in the animal mounds of Wisconsin-Lapham's *Antiquities of Wisconsin*, pp. 65, 70 and Plate XLV, No. 4; Squier and Davis *Ancient Monuments*, p. 130, and Pl. XL III, No. 8.

[13] Squier and Davis, *Ancient Monuments*, p. 271, Fig. 190; *Flint Chips*, p. 431, Fig. 74.

[14] Squier and Davis, *Ancient Monuments*, p. 234, Fig. 131.

[15] *Smithsonian Report*, 1871. p. 394.

[16] *Second Annual Report, Peabody Museum*, p. 16.

[17] Squier and Davis, *Ancient Monuments*, p. 257, Fig. 160.

[18] *Proceedings Davenport Acad. of Science*, vol. 1, Pl. IV, No. 11.

[19] *Smithsonian Report*, 1870, p. 403.

[20] Squier and Davis, *Ancient Monuments*, p. 257, Figs. 158, 159, 160.

[21] *Id.*, p. 234, Fig. 131; *Flint Chips*, pp. 452, 480.

Raccoon.—Fragment of pipe from Ohio mound[1] and pipe from mound No. 3, Naples, Ill. (*Ante*, p. —, Fig. —.)

Opossum.—Bones found by Prof. Putnam in a mound on the Wabash River, Indiana.[2]

Beaver.—Three sculptured pipes from Ohio mounds.[3] Bones found in mound No. 7, Naples, Ill. Skull found in mound in Dakota.[4]

Muskrat.—Skull in mound in Dakota.[5]

Otter.—Fragment of pipe from Ohio mound.[6]

Mink.—Either this animal or the weasel, which is very similar in form, is represented in an animal mound of Wisconsin.[7] Some of the animal forms represented in mounds are easily recognized, while others are hard to determine. For example, Squier and Davis say of one: "It human figure."[8]
may have been intended to represent a bird, a bow and arrow, or the

Skunk.—Fragment of skull from mound No. 6, Naples, Ill. (*Ante.*, p. —), and skull found in mound in Dakota.[9]

Squirrel.—Mound pipe from Ohio.[10] From the marking on the side it may be that this specimen was intended to represent the flying squirrel, *Pteromys volucella.*

Gopher (*Spermophilus Franklini*) Sabine.—Ohio mound pipe.[11] Several species of this family are so nearly allied that it is not certain which was intended to be represented.

Manatee.—Seven sculptured pipes from Ohio mounds.[12]

Walrus.—Pipe from Ohio mound.[13]

Alligator.—Drilled teeth found in Ohio.[14]

Turtle.—Pipe from Ohio mound.[15] Pipe from mound No. 2, Naples, Ill. (*Ante*, p. —, Fig 5.) Bones found in mound on the Wabash River, Indiana, by Prof. F. W. Putnam.[16] Represented in animal mounds of Wisconsin.[17]

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[1] *Flint Chips*, p. 430, Fig. 68.

[2] Foster's *Prehistoric Races*, p. 137.

[3] Squier and Davis, *Ancient Monuments*, p. 257, Fig. 155; *Flint Chips*, p. 428, Fig. 63.

[4] *Smithsonian Report*, 1871, p. 392.

[5] *Smithsonian Report*, 1871, p. 394.

[6] Squier and Davis, *Ancient Monuments*, p. 257, Fig. 156.

[7] Lapham's *Antiquities of Wisconsin*, Plate XXIX.

[8] Squier and Davis, *Ancient Monuments*, p. 130.

[9] *Smithsonian Report*, 1871, p. 394.

[10] *Flint Chips*, 428, Fig. 62.

[11] Squier and Davis, *Ancient Monuments*, Fig. 157; *Flint Chips*, p. 428, Fig. 61.

[12] Squier and Davis, *Ancient Monuments*, pp. 251, 252; Figs. 153, 154; *Flint Chips*, p. 429, Figs. 65, 66.

[13] Squier and Davis, *Ancient Monuments*, p. 271, Fig. 192; *Flint Chips*, p. 430, Fig. 67.

[14] Squier and Davis, *Ancient Monuments*, p. 282, Fig. 197.

[15] *Flint Chips*, p. 423, Fig. 43.

[16] Foster's *Prehistoric Races*, p. 137.

[17] Lapham's *Antiquities of Wisconsin*.

Frog.—Sculptured figure in mound pipe of Davenport collection,[1] and pipe taken from mound No. 8, at Naples, Ill.

Toad.—Sculptured figure in mound pipes of Ohio.[2]

Serpent.—Coiled around sculptured pipes from Ohio mounds.[3] Represented in an immense earthwork, Adams County, Ohio,[4] and in the animal mounds of Wisconsin.[5]

Rattlesnake.—Carved on Ohio pipes;[6] carved figure found in Ohio mound,[7] and figures carved on shells found in mounds of Tennessee.[8]

Lizards.—Represented in animal mounds of Wisconsin.[9]

Shells.—Many marine species have been exhumed from the mounds. The *cassis*, *fulgur perversus* of Lamark, the *oliva*, *marginella*, and *natica*, and probably *strombus* found in mounds of Ohio.[10] Splendid specimen of a *fulgur perversus* taken from mound No. 1, Naples, Ill. Large numbers of these have been found in mounds near the mouth of the Illinois River by the Hon. William McAdams, many of which were exhibited by him at the Boston meeting of the American Association. Shells of the common mussel were found by the writer at the base of mound No. 3, Naples, Ill. Great numbers of beads made from the species *marginella*, *oliva*, and *natica* have been found in the mounds.[11] Of fluviatile species the mounds of Ohio have furnished *unio ellipticus*, *rectus*, *verrucosus*, and *ovatus*, "all existing at the present time in the neighboring streams."[12]

Bald eagle.—Sculptured pipe from mound No. 8, near Naples, Ill.[13]

Eagle.[14]

Hawk.—Sculptured pipes from mounds of Ohio.[15]

Owl.—Three species, viz: "Great owl, horned owl, and the little owl" are recognized in the scultpured pipes from the Ohio mounds.[16]

Turkey buzzard (*Carthartes aura*).—Sculptured pipe from mounds of Ohio.[17]

Wild turkey.—Bones found by the writer in mounds Nos. 6 and 7, Naples, Ill.

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[1] *Proceedings Davenport Academy of Science*, vol. 1, p. 118, and Plate IV, Fig. 5.

[2] Squier and Davis, *Ancient Monuments*, p. 268, Figs. 183, 184, 185.

[3] Squier and Davis, *Ancient Monuments*, pp. 248, 268, Figs. 143, 186.

[4] *Id.*, p. 96, Plate XXXV.

[5] Lapham's *Antiquities of Wisconsin*, pp. 37, 38.

[6] Squier and Davis, *Ancient Monuments*, &c., p. 268.

[7] *Id.*, p. 276.

[8] *Fifth Annual Report Peabody Museum*, pp. 17, 18, and *Id.*, vol. 2, p. 89.

[9] Lapham's *Antiquities of Wisconsin*.

[10] Squier and Davis, *Ancient Monuments*, p. 283; Foster's *Prehistoric Races*, pp. 234, 235.

[11] Squier and Davis, *Ancient Monuments*, p. 233.

[12] Squier and Davis, *Ancient Monuments*, p. 284.

[13] Squier and Davis, *Ancient Monuments*, p. 259.

[14] Squier and Davis, *Ancient Monuments*, p. 70.

[15] Squier and Davis, *Ancient Monuments*, p. 259, and Fig. 165; *Flint Chips*, p. 428, Fig. 60.

[16] Squier and Davis, *Ancient Monuments*, p. 259; *Flint Chips*, p. 427, Fig. 57.

[17] Squier and Davis, p. 260, and Fig. 171; *Flint Chips*, p. 427, Fig. 58.

Prairie hen (*cupidonia cupido*), Linn).—Sculptured pipe from Ohio mound.[1]

Also, pipe from Davenport mound, Iowa.[2]

Quail (*Ortyx virginianus*).—Sculptured mound pipe from Ohio.[3]

Toucan.—Sculptured pipes from Ohio mounds.[4]

Parroquet.—Sculptured pipe from Ohio mound.[5]

Cedar bird, (*Ampelis cedrorum*).—Sculptured pipes from Ohio mound.[6]

Swallow.—Sculptured pipes from Ohio mound.[7]

Night heron.—Sculptured pipe from Ohio mound.[8]

Wood duck (*Aix sponsa*).—Head sculptured upon Ohio mound pipe.[9]

Prof. C. W. Butler, comparative anatomist, Champaign, Ill., very kindly identified for me the bones found in the Naples mounds.

From the foregoing list it may easily be surmised that all the animals found in the Valley of the Mississippi upon the advent of the white race were familiar to the builders of mounds, also possibly some whose habitat was far distant, such as the mastodon and walrus of the north or the manatee, the toucan and tropical shells of the south.

From the "finds" in the Naples mounds we can plainly see that considerable commerce was carried on by their builders, as we here find a shell from the coast of Florida, obsidian from Mexico, lead ore from Wisconsin, copper from Lake Superior, and mica from the Alleghanies. It was once contended that the great age of the mounds was shown by the fact that they had never been found upon the latest or lowest river terraces. This statement has been disproved, however, as in more than one instance in the west they have been found upon the lowest terrace. The largest mound explored at Naples is in the low-lands upon the very brink of the river. Man naturally selects elevated positions for burial sites. Mounds of observation would be built upon the highest points, while other mounds, whether for houses, temples, or for whatever purpose they might be built, would as a rule be placed beyond the reach of overflows. These suggestions sufficiently account for the usual absence of these ancient works upon the low-lands along the rivers.

This locality is also rich in finely-worked stone implements. None, however, have come from the mounds, but some of the finest articles of chert were found a few feet below the surface at the foot of the bluff upon which the eagle-pipe mound is situated. Below this about two miles was the ancient quarry from which the chert was taken to manufacture knives, arrow-heads, and spear-heads. At the base of the Burlington limestone bluff are found hundreds of fragments of chert implements, broken and cast away by the workmen, amidst thousands of chips. The material was obtained from the nodules in the limestone and worked on the spot, but whether by the ancient mound folk or the more modern Indian there is nothing to indicate. In an old book called the *Navigator*, the writer, Patrick Kennedy, who passed up the Illinois River in the year 1773, says "The Peories wintering-ground is 48 miles from the Mississippi. - - - Pierre Island is some distance above, near which, from a hill on the western side, the Indians procure a *flèche* or arrow-stone, with which they make their gun flints and point their arrows." On an old map, furnished to Governor Edwards in 1812 by John Hoy, a Frenchman, is found a creek marked *Pierre à la Flèche*. In a letter to the Secretary of War, May, 1812, Governor Edwards called this creek the Arrowstone. It is now known as Flint Creek. The French no doubt derived the name from the Indians,

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[1] *Flint Chips*, p. 425; Fig. 51.

[2] *Proceedings, Davenport Academy of Science*, vol. 1, Plate IV, No. 14.

[3] *Flint chips*, p. 425, Fig. 50.

[4] Squier and Davis, *Ancient Monuments*, pp. 260, 266, Figs. 169, 178; *Flint Chips*, p. 426, Figs 53, 56.

[5] Squier and Davis, *Ancient Monuments*, p. 265, and Fig. 172.

[6] Squier and Davis, *Ancient Monuments*, p. 265, and Figs. 173, 174; *Flint Chips*, p. 424, Fig. 48.

[7] Squier and Davis, *Ancient Monuments*, p. 260, and Fig. 167; *Flint chips*, p. 424, Fig. 47.

[8] Squier and Davis, *Ancient Monuments*, p. 259, Fig. 164; *Flint Chips*, p. 425, Fig. 52.

[9] Squier and Davis, *Ancient Monuments*, p. 260 and Fig. 168.

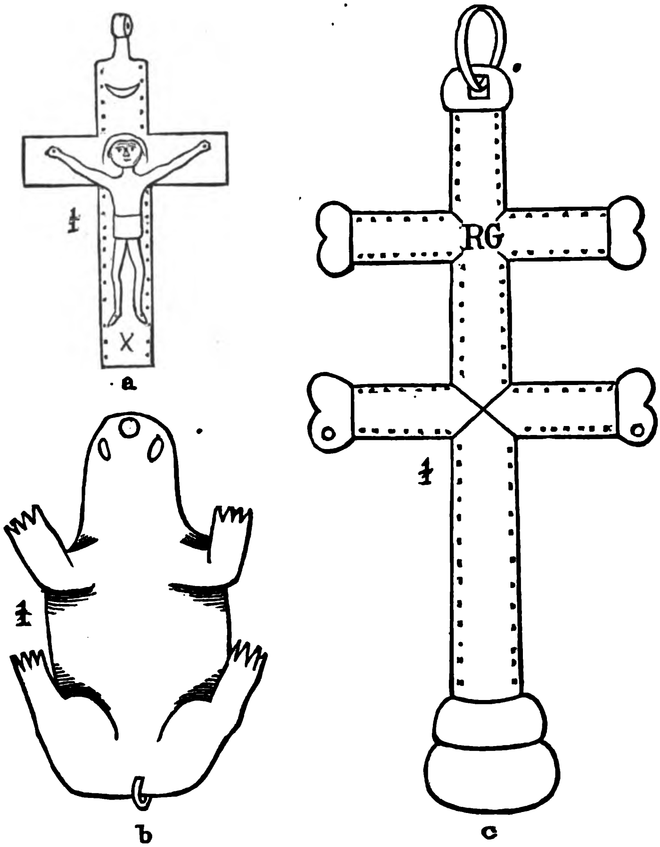

FIG. 28. European objects from mounds.

and that *Pierre à la Flèche* was a translation of the equivalent Algonkin. With these facts as a starting-point, the writer found the "workshop," which probably had been the scene of busy labor for centuries.

Upon the banks of the river at Naples are the burying-grounds of the modern Indian, in which have been found many stone implements intermingled with civilized manufactures, such as beads, knives, crosses of silver, and other articles indicating traffic with the French during, probably, the latter part of the seventeenth and the first half of the eighteenth centuries. Some of these articles are shown in Fig. 28.

The above are all in the private collection of Richard H. Keener, esq., of Naples, Ill., who first gave the writer information relative to the former exploration of mounds in the vicinity. The pottery exhumed from this ancient cemetery shows that it was the common burial-place of the race that built at least a part of the mounds, while the above and similar articles of French manufacture show that the same place was used as a burial site by the modern Indian. The same reason that prompted these ancient races to select this locality as the resting-place of the dead caused our own people to locate their cemetery within a few hundred yards of the ancient one and upon the same ridge, just as the modern city occupies the ancient village site, and the highways of travel follow the ancient trails, the bones of races, separated by thousands of years, in time mingle together and molder into common dust!

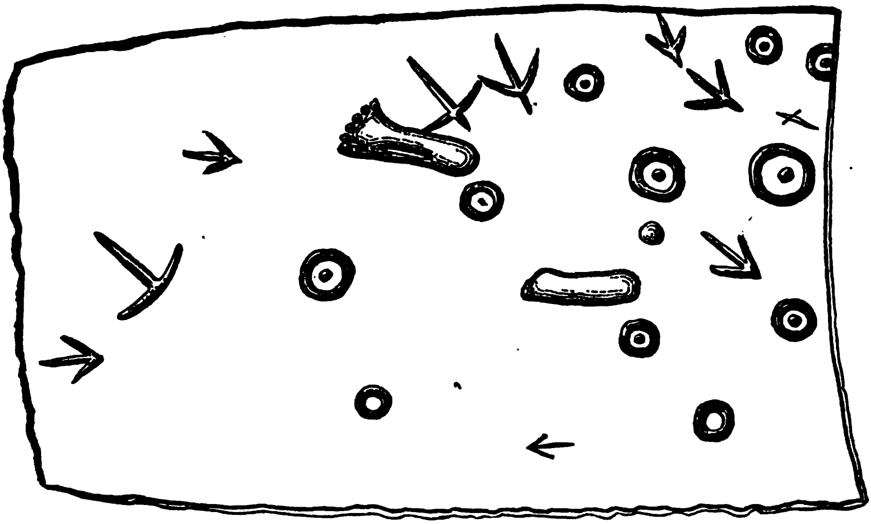

FIG. 29. Pictographs on slab from rock-shelters near Naples, Ill.

Though not immediately connected with this subject, yet possibly the work of the same race who built the Naples mounds, attention is called to foot-prints and other marks on a limestone slab found in a rock-shelter on the east side of the Illinois River, about 10 miles below Eagle-pipe mound. This slab originally formed a projecting shelf in the rock-shelter, but is now broken off and stands on its edge at the opening of the shelter.* From the preceding cut, Fig. 29, it will be seen that there is a remarkable similarity between the tracks and other markings upon this rock and those of the Barnesville and Newark "track-rocks" of Ohio, as figured in the *Ohio Centennial Report*, pp. 91, 92, 93, 95, and pp. 58 and 59 of the *Journal of the Anthropological Institute of New York.*

Mr. J. H. Salisbury† maintains, "that the ancient bird-track character belonged to the mound-builders is evident from the fact that it is found among their works constructed of soil on a large scale. One of these bird-track mounds occurs in the center of the large circular inclosure near Newark, Ohio, now standing in the Licking County Fair Grounds." On the lowlands, half a mile south of this rock-shelter, are sixteen mounds, in a straight line, running a little east of north, and directly toward the rock-shelter. These mounds are all about 2½ feet high and about 25 feet in diameter. Nothing has been found in them. Those toward the south are composed largely of slabs of Burlington limestone obtained from the neighboring bluff, while those toward the north are composed wholly of earth. Another similar row of mounds is found in Scott County.

In conclusion, I will add, the dividing line between the *mound-builders* and the modern Indian—that is, the Indians of the Mississippi Valley of two hundred years ago, and especially those inhabiting the lower part of that great valley, is not so distinct as is generally supposed. It is almost the universal opinion of those who have made the subject a study that the mound-builders were not the ancestors of the red Indian, but, on the contrary, were a distinct race, much further advanced in civilization, and that by choice or pressure of barbarous tribes from the north they abandoned their homes, or that they were exterminated by war, famine, disease, or domestic dissensions. Fully imbued with this idea, the writer began the study of the relics of this nameless race, but in the end has been compelled to abandon this received opinion and to conclude that the mound-builders were the ancestors of the southern tribes. There is no distinctive feature, whether physical or anatomical, whether in art or custom, that would stand the test of criticism as peculiar to that ancient race. If the comparison is made between the earthworks, implements, copper ornaments, pottery, and other relics of the mound-builders and the works and character of the modern Indian, with a straw hat on his head, a Mackinaw blanket and calico shirt about his shoulders, skinning animals with a steel knife of yankee manufacture, cooking his food in an iron pot from the same source, and all the manhood that was ever in him crushed out by fire-water and contact with the worst elements of civilization and fear of a dominant race, then, indeed, the line is distinct and well marked; but if instead of the modern Indian we substitute the red man, who lived in the valley of the Mississippi two or three hundred years ago, as described by the chroniclers of De Soto's expedition, or by the followers of Loyola, who, carrying the cross through prairie and desert and wilderness, ever had an eye open and a pen ready to record the character, customs, habits, and superstitions of the strange race about them, then the line of demarkation fades away, if it does not entirely disappear. Here we find mound-builders, fort-builders, manufacturers of stone implements, pottery, bark-cloth, feather-cloth, ornaments—in short, a race of men dependent on their own resources for supplying their wants of every nature, physical or mental.

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* A plaster cast of this track-rock was presented to the Smithsonian Museum in 1878.

† *Centennial Report*, p. 96.

A dying race—a race crushed out by the struggle of nations for room in the world, with no human heart to appreciate and no historian to record its wrongs, its own virtues lost, and to its vices added the vices of civilization, is not a fit subject for the scientist, but rather for the moralist.

THE GLIDWELL MOUND, FRANKLIN COUNTY, INDIANA.

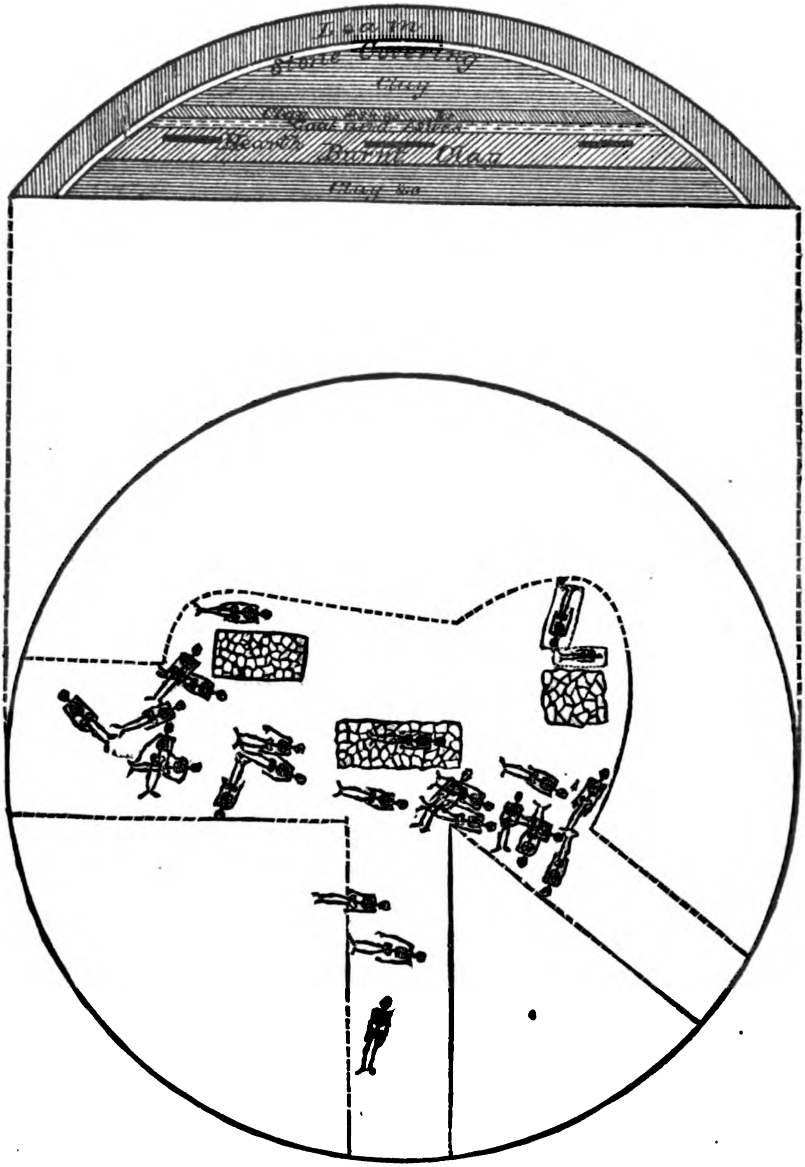
By Dr. G. W. Homsher, *of Fairfield, Ind.*

This mound is two miles south of the village of Fairfield, Franklin County, Indiana, and is situated upon a very high hill, or bluff, and on the East Fork of the White Water River. It faces the river on the east side, almost opposite the mouth of Wolf Creek. To the south and east of the hill is Templeton's Creek, both creeks emptying into the White Water. On the south side and at the foot of the hill are two very fine springs which never run dry.

From the water's edge of the river to the summit of the hill is 796 feet. Surrounding the hill, facing the river and Templeton's Creek are five terraces, commencing at a ravine on the north side of the hill, passing across the west side, thence around the south side, about two-thirds of the distance. Time and constant washing have obliterated them beyond that point.

These terraces originally were from 30 to 50 feet wide, but at the present time they measure, commencing at the base of the hill, the first, 32 feet in width; the second, third, and fourth, 24 feet in width; and the fifth, 48 feet in width. The distance from the water's edge to the first terrace is 300 feet; from the first to the second is 64 feet; from the second to the third, 80 feet; from the third to the fourth, 104 feet; from the fourth to the fifth, 80 feet; and from the fifth to the summit of the hill is 168 feet. On the west side (where these measurements were taken) the bank facing the river is almost perpendicular. It is almost impossible for one to climb the hill from the fifth terrace to the summit on the west side, or that side facing the river. These terraces are also broader on that side and are the least washed, in fact, there are no gullies cut down through the hill or terraces. Large oak, maple, elm, hickory, iron-wood, beech, and gum trees are growing all over them.

From the summit of this hill one has a grand view of the valley extending north about 7 miles, and can see the locations of other mounds that dot the hill-tops and second terraces of this beautiful and productive valley, and those along Wolf Creek and other tributaries that empty into the White Water.



A.—The Glidwell Mound, Franklin Co., Ind.

The Rev. J. P. MacLean, of Hamilton, Ohio, claimed these so-called terraces to be land-slides, but acknowledges those surrounding the fortified mound on the Templeton hill to be the work of the mound-builders. Now, the terraces surrounding the fortified mound on Templeton's hill are five in number, the same as that of the Glidwell mound; their width ranges from 24 to 30 feet. The distance from one to another is from 60 to 120 feet. Again, it is not likely that three terraces surrounding the same hill would measure the same in width and run parallel with each other from one side to another, and be land-slides. Such, it will be noticed, is the case with the second, third, and fourth of those surrounding the Glidwell hill.

Furthermore, no land-slide has been found across any of the hills or bluffs, along the White Water, without a break at least every hundred or two hundred feet. But such is not the case in any of the above-mentioned five terraces, which measure from 700 to 900 feet in length, without a break or gully, and they are sufficiently wide to drive two road-wagons side by side from one end to the other. The similarity of the two fortified mounds is almost complete. The measurements of the length of the terraces and the height from the water's edge of the Templeton hill was not taken, but the Templeton hill is much higher than the Glidwell hill, and commands a fine view of the White Water south to Brookville, where the East and West Forks unite into one stream.

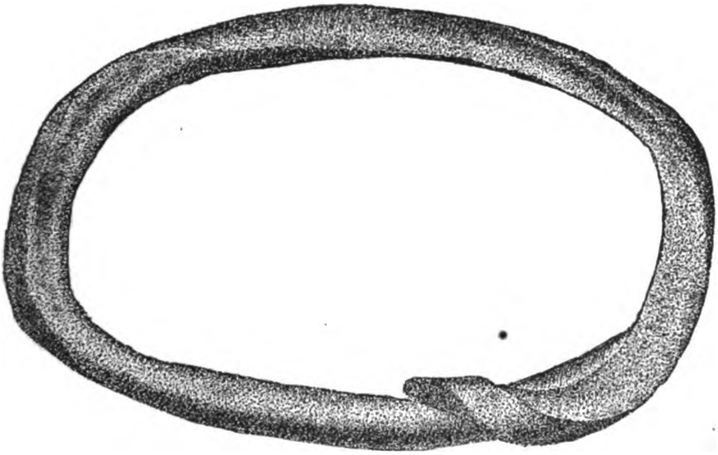


FIG. 1.—Copper bracelet from Glidwell Mound.

The first time the writer visited the Glidwell mound was in April, 1871. It was then 15 feet high and 60 feet in diameter. Mr. T. L. Dickerson assisted in taking these measurements. The composition of the mound is of fine brick or compact clay, which has been brought from Wolf Creek, almost three-quarters of a mile from the mouth of the creek and one mile from the summit of the hill or mound. This mound was covered with flat, shelly limestone, one overlapping another, similar to shingles upon a roof. Over this was a deposit of loam varying from 1½ to 3 feet. On the west side are still standing two iron-wood trees about 13 inches in diameter, also a large maple. On

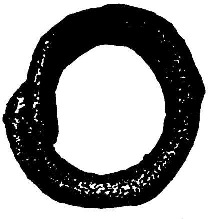


FIG. 2.—Copper ring from Glidwell Mound.

the north side, about one-third the distance up the mound is a large maple 2½ feet in diameter. On the east side are large beech, maple, and iron-wood trees. At the edge of the mound and on the south side is a stump of a large maple, very much decayed. There are five distinct strata (see vertical section): No. 2 is 5 feet thick and of compact clay; No. 3 is 1⅙ feet thick and is composed of ashes and clay; No. 4 is 8 inches, and consists of ashes and coal; No. 5 is 2½ feet thick, and made of burnt clay; No. 6 is 2⅔ feet deep, and composed of clay and burnt stones. Between the strata Nos. 4 and 5 were three hearths made of sand and limestone, one in the center, one in the northeast, and the third in the northwest part of the mound. (See foregoing sketch, A.)

In June, 1879, in company with Mr. T. L. Dickerson and Thomas Glidwell, the writer sunk a shaft 12 feet deep into the center, and in the course of the work removed one skeleton with several fragments of pottery and one fine copper bracelet (Fig. 1). The copper had been pounded into a thin sheet and then rolled. A similar one, but smaller, was found some time afterwards by Mrs. A. Crist in the same mound, and is now in Mr. A. W. Butler's collection (Fig. 2). The above-mentioned skeleton was 6 feet 3 inches below the slabs or rock covering (base section, center figure, head to the east.)

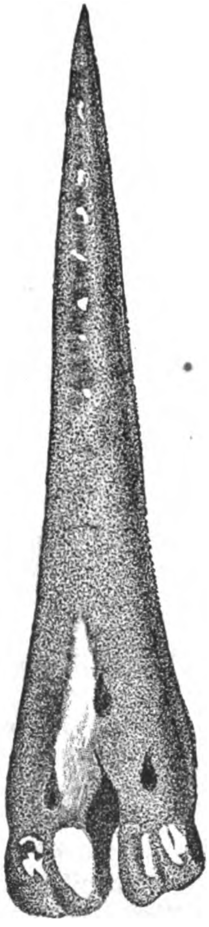


FIG. 3.—Bone awl from Glidwell Mound.

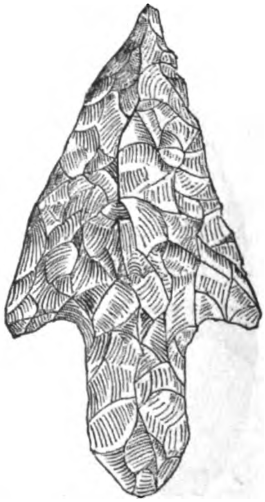


FIG. 4.—Arrow point from Glidwell Mound.

In July, 1880, the writer visited the mound in company with Mr. C. W. Ruse, and commenced a trench 5 feet wide in the southeast side, about 5 feet from the base (base section, dotted line), and trenched to the center. When within 3 feet of center shaft we came upon and removed a skull, which was 5 feet from the top of the mound and 3 feet below the rock covering. But, strange to say, no other part of the skeleton could be found, or any marks of decayed bones. After the center shaft was reached it was sunk 2 feet deeper, and trenched back to the place of beginning. In the process six skeletons were removed in a very good state of preservation, two with heads to the east; one to the south; one to the north; one to the southeast; one to the northeast. Over one skeleton, whose head pointed to the east, were laid two others (see base section), the head of one to the south, of the other to the north. With this group were found one bone bodkin or needle (Fig. 3); two arrow-points (Fig. 4); several pieces of animal bones, with a few fragments of pottery (Fig. 5).

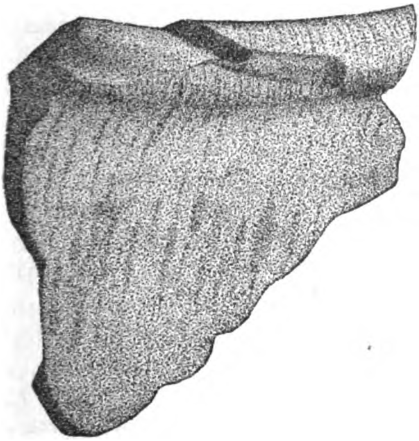


FIG. 5.—Pottery from Glidwell Mound.

In August, 1880, in company with Mr. J. E. Snider, the writer continued his investigation by commencing a trench on the west side about 4 feet from the base (base section, dotted lines), and trenched to the center shaft, removing four skeletons. Three of these lay with their heads to the east; one with the head to the south, or rather a little to the southeast (see base plan of sketch A). With the group of three were found several pieces of pottery, one

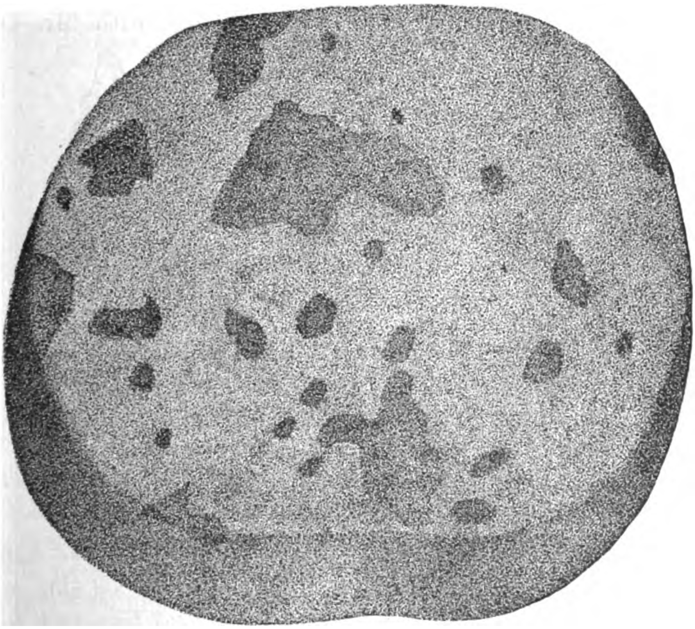


FIG. 6.—Burnt disk from Glidwell Mound.

burnt disk (Fig. 6), one pendant, etchings on one side, diagonal lines on reverse (Fig. 7). The six skeletons removed with Mr. Ruse's assistance

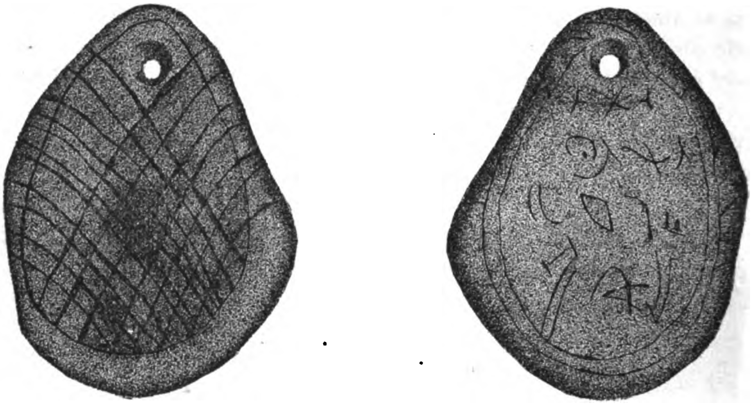


FIG. 7.—Pendant from Glidwell Mound.

were 6 feet 9 inches below the rock covering. The four removed with the aid of Mr. J. E. Snider were 5½ feet below the rock protection, near the enter of the mound.

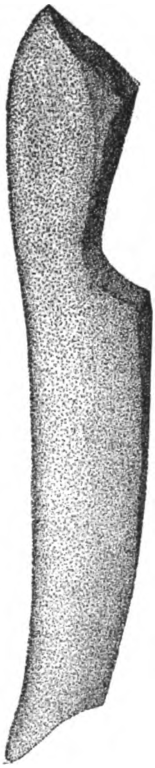


FIG. 9.—Chert chip from Glidwell Mound.

May 10, 1881, the Rev. C. W. Hargett and Mr. E. Osborn helped to open a trench 6 feet wide on the south side of the mound, and 2 feet below the surface surrounding the mound (see base plan of first sketch A,—dotted lines), and continued to the center shaft. At this time were removed four skeletons. With the second skeleton, under the lower jaw, were found two beads (Fig. 8) made of the *unio* shell, split deer or elk bones (Fig. 9), and a few chips of flint, or chert. The first skeleton was 4 feet below the rock protection; the second 4 feet 7 inches; the third 6 feet 5 inches; the fourth, near the center, was 6 feet 10 inches below the protection.

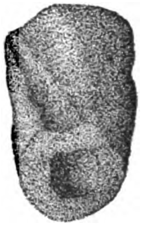


FIG. 8.—Bead from Glidwell Mound.

August 23, 1881, by the assistance of the Rev. C. W. Hargett, Lewis Mullien, and William Hippard, an infant skeleton was found 7 feet below the rock covering, and a little north of the center hearth, in a direct line with the northeast and northwest hearths. (See base section.) Over this skeleton had been placed two large flat stones. The bones were very much decayed, so much so that there could be removed only a few fragments of the skull. The skeleton measured in length 3 feet 1½ inches. No ornaments of any kind were found with this skeleton. It lay with the head to the east. To the east of the skeleton, a small stone hearth was discovered, made of small round stones, principally sandstone. August 29, 1881, Mr. A. W. Butler and Rev. D. R. Moore commenced near the center and trenched to the west side, following the old trench made by the writer and Mr. J. E. Snider. In doing so they removed three skeletons or parts, one lying with the head to the north, one northwest, and one northeast. (See base section.)

September 5, 1881, with the aid of Mr. A. W. Butler, digging was commenced again at the place where Mr. Butler and Moore left off, and continued to the north and east; two skeletons were removed one with the head to the northeast, one with the head to the east, and one overlapping across the middle the one whose head pointed to the east. A fine gorget (Fig. 10), about one-fourth of a large celt, some fragments of pottery, and animal-bones were found.

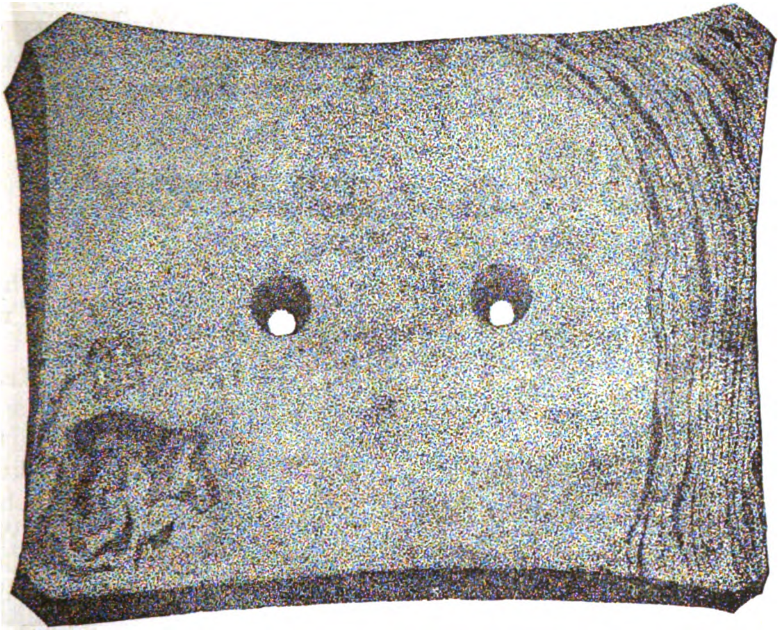


FIG. 10.—Slate "gorget" from Glidwell Mound.

September 12, 1881, the same party again visited this mound and continued investigations. Two skeletons were removed, one with the head to the north, one with the head to the east. (See base section.) A stone hearth was found in the northwest part of the mound. This hearth was made of small bowlders. A little north of the covering of the infant was removed a skeleton of an adult, protected similarly to that of the infant, the head pointing to the south. The skeletons removed by Mr. Butler and the writer were from 5½ to 6 feet below the rock covering. The fragments of pottery removed from this mound bore, no ornamental etchings or moldings upon them. They were unglazed, both externally and internally, and were made of fine quartz sand or pulverized quartz, pulverized shell, and fine, compact clay. The bone bodkin is evidently made from the bone of the deer. The only parts of the above-named skeletons which could be recovered were the crania, and they badly decayed. In fact only one was removed in such a condition that it could be put together, and that one is deposited in the museum of the Brookville Natural Historical Society. The prominent features of that are an exceedingly narrow forehead, receding, with an extremely broad occiput, zygomatic arch large and prominent, inferior maxillary large and massive.

I find the characteristics mentioned by Mr. Gillman (*Smithsonian Report*, 1875) in about four-fifths of the humeri and tibias removed from this mound, but in the several parts of the skull no perforation as spoken of by the above-named gentleman.

The dotted lines show that part of the mound that has been removed. All that outside of these lines has been reserved for future investigations.

REMAINS ON WHITE WATER RIVER, INDIANA.

By George W. Homsher, M. D., *of Fairfield, Ind.*

The mounds, workshops, cemeteries, block-houses and camping grounds herein described are located on the East Fork of White Water River, in a portion of Brookville, Springfield, Bath, and Blooming Grove Townships, and in all parts of Fairfield Township, Franklin County, Indiana; in all of Harmony, with a portion of Center and Liberty Townships, in Union County; and also, in portion of Jackson and Jennings Townships, of Fayette County.

The East Fork of White Water River is a beautiful stream, whose head waters originate in the northeast part of Wayne County, Indiana, flowing in a southern direction through Wayne, Union, and Franklin Counties, to a point near the center of Brookville Township, just south of the town of Brookville, where it joins the West Fork. These united form the White Water which runs in a south and east course across the southern part of the township until it crosses the southern boundary line near the southeast corner, thence south and west until it empties into the Ohio River near Lawrenceburg. Both branches and their tributaries are noted for the richness of the soil, as well as for the great number of mounds, workshops, cemeteries, &c., that are distributed upon their upper and lower terraces from their sources to their mouths. In touching upon the location of the structures, &c., reference will be made to the townships and sections. And in this report the range, as well as the survey and description of each structure is given. Thus by the aid of the map all the ancient structures may be visited without any difficulty whatever.

In a paper read before the Brookville Natural Historical Society, the writer touched upon the mounds, workshops, cemeteries, &c., of a portion of Brookville, Springfield, Bath, and Fairfield Townships, of Franklin County. The society appointed a committee to prepare a complete map of the county, locate each structure, and give a description thereof.

As this committee has not made a report, in this communication will be presented the latest survey, which includes the townships mentioned above. The distance from Brookville to mound No. 80, the most northern here described, is 16 miles. The townships of Liberty, Center, and Union, of Union County, have been only partially investigated. Several tumuli are said to exist within these townships, but the exact location is not known. Just east of Brookville is a very high hill, whose headland juts out to the river, and from the apex of this hill, one looking south has a grand view of the White Water below the junction of the two rivers, and of a few of its tributaries, for several miles. To the west and northwest, up the beautiful valley of the West Fork, the eye becomes tired with the picturesque landscape of the whole valley, whose second and third terraces are dotted o'er with ancient earthworks, both single and in groups. Again, looking north, up the East Fork, we behold another enchanting scene, whose lofty hills hug close the clear waters from either side as it winds its way through the fertile valley and along its course.*

The writer has spent many pleasant hours investigating the last resting places and other structures of a people who once spent their time here in fishing and hunting, and in the cultivation of the cereals upon which they partly subsisted.

Mound No. 2 is in Sec. 5., T. 9 N., R. 2 W., near the southwest corner of the southwest quarter section, almost directly opposite the bridge that spans the river at the base of the hill, on the west side of the river, and between two ravines, one on the north and the other on the south side of the hill. This is known as the Templeton's Fortified Mound, an account of which was given by Edgar Quick in the Smithsonian Report for 1879, and by Dr. Rufus Hayman in the Geological Report of Franklin County, Indiana, of 1869. The Doctor's report is, to some extent, incorrect, so far as the description of the work is concerned. This mound is on the top of a very high hill, not less than 375 or 400 feet high. It is built on a plateau, back from the apex of the hill at least 500 yards, and partly surrounded by a semi-circular wall on the east side and a ditch on the west. The semi-circle extends across the plateau from the ravine on the north side to the ravine on the south side. This semi-circular wall is very distinct, measuring, in some places, 3 feet in height. The ditch on the inside of the wall was formed by the removal of the dirt to construct the wall. It measures, in some places, from 2 to 2½ feet in depth. If there was a wall of any description on the west side it has been obliterated. About 250 yards on the west side is a very wide ditch, from 9 to 10 feet, symmetrical from one end to the other, and about 3 to 4 feet deep. In it and on its banks are growing some very large trees. Surrounding the hill are five terraces, commencing some distance up the ravine on the side of the hill facing the north, thence passing around the hill facing the south, extending some distance up the ravine on the south side of the hill. These terraces vary in width from 20 to 40 feet, and from one to another as you ascend the hill the distance is 50 to 75 feet. The length of those terraces also varies from 600 to 800 yards. The outlines and formation are defaced but little, only a few gullies having cut their way through them to mar their symmetry. The whole hill is covered by a very heavy forest, and trees are growing upon the terraces and hillside that will measure from 4 to 4½ feet in diameter; in fact, this hill in outline is similar to the Glidwell Fortified Mound, with the same number of graded ways or terraces. The construction of these graded ways, with semi-circular walls and ditch, is conclusive evidence that this hill, at one time, was an ancient fortification. The original height of this mound, by measurement of the several strata, is 10 feet, and the diameter at base 40 feet. It is composed of brick clay, ashes, and charcoal. The mound has been badly mutilated by curiosity seekers; skeletons have been thrown out promiscuously and broken, which no doubt with a little care could have been removed intact. Mr. James Rucker, who took great interest in the study of archæology, informed the writer, in regard to the positions in which the subjects were laid in this mound, that they were placed promiscuously throughout that portion of the mound which has been mutilated, and all within the clay forming the base stratum. He himself removed several, but not knowing how to treat them properly, they were broken into fragments in his efforts to preserve them, and, deeming them of no value, he threw them out with the dirt among the rubbish.

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* Mr. C. C. Royce, on his map showing the cessions of land by Indian tribes to the United States, in the annual report of the Bureau of Ethnology for 1879–1880, lays down the junction of the East and West Forks just south of Connersville, and about midway of the lines of the old boundary line and the 12-miles purchase. This is a mistake. The two forks unite within the territory known as the Wayne purchase.

A portion of the mound still remains undisturbed. This will afford an opportunity perhaps to secure a portion of the remaining objects which have been entombed therein. From this mound there is a good view of the uplands between the two forks of the White Water, also mounds 1, 3, 4, 5, 6, and 12 can be seen.

Number 3 is on the same side of the river, about one-half mile north, and located in Sec. 4, T. 9 N., R. 2 W., midway of the west part of the northwest quarter section 4, on Mr. George Templeton's farm. This mound is a little more than half way up the hill, in the center of a depression about the shape of a horseshoe. Above, below, and on each side of the depression it has about the same angle of descent as that of other parts of the hill. This is the only mound the writer has ever seen built midway of a hill.

Number 4 is in the northeast corner of the southeast quarter Sec. 9, T. 9 N., R. 2 W., on Mr. Jeff. Logan's farm, on the second terrace formation. Originally it was about 6 feet high, with a base diameter of 50 feet; but it has been under annual cultivation for about forty years, which has almost obliterated it. A few more years will level it with the surrounding earth. As to whether bones of any description have ever been found in this mound during the process of tilling or otherwise no information can be obtained. Mr. James Rucker, when living, secured a great many arrow-points, axes, &c., from the field in which this mound is located.

Number 5 is in T. 9 N., R. 2 W., near the southwest corner of the southwest quarter section 2, on Mr. James Logan's farm, and on the highest terrace formation, on the west side of a small creek that runs through the farm and empties into the south fork of Templeton's Creek at Locks Chapel. This mound is 4 feet high, 30 feet in diameter at the base, and is composed of fine brick clay. From this mound, looking to the east, one can see mound No. 6 in the northeast corner of the southeast quarter Sec. 1, T. 9 N., R. 2 W., which is also on one of Mr. James Logan's farms, on the highest terrace formation. This mound is 4 feet high, with a base diameter of 40 feet, and is composed of brick clay.

Number 7 is in T. 9 N., R. 1 W., Sec. 6, midway between the east and west quarter section lines, of the southeast quarter, and only a few rods from the north quarter section line. The height is 4½ feet, the diameter at the base 30 feet, and it is composed of brick clay.

Number 8 is in T. 9 N., R. 1 W., Sec. 5, near the northwest corner of the northwest quarter section, close to the Billingsville and Springfield pike. The field in which this tumulus stands joins the pike, and is known as the mound field. The height of the structure is 6½ feet, the diameter at the base 50 feet, and it is composed of brick clay.

Number 9 is in Sec. 35, T. 10 N., R. 2 W., in the southwest corner of the northeast quarter, on the north side of the south fork of Templeton's Creek, on the highest terrace formation, and on Mr. Mark Mullien's farm. The height is 5 feet, the diameter at the base, 45 feet, and the composition compact clay.

Number 10 is in the same section, northeast of No. 9 but a few rods, on the same farm. The composition is compact clay.

Number 11 is a circle, in Sec. 25, T. 10 N., R. 2 W., midway between the north and the south quarter-section lines of the northeast quarter, and 10 rods from the west quarter-section line, on the side of the south fork of Templeton's Creek, and on Mr. Henry Fry's farm. This circle is 80 feet in diameter and 242½ feet in circumference. The embankment forming the circle is 2½ feet high. On this embankment are hickory trees from 3 to 3½ feet in diameter. Within the circle or embankment there is not a tree, but outside of it on every side are heavy woods. This circle, like others examined, was constructed for protection to the dwelling, and not for an arena in which, or around which, were performed various ceremonies. Probably it was not constructed for a protection during a war among the tribes; but after the erection of the dwelling the savages dug this circle just inside of their building, so that in case of rain the water would be carried off and not run within, thus securing to the occupant a dry and comfortable floor. Otherwise, the ground within being tramped down, would be lower than that outside, and, when it rained, the water would run within the wigwam and make a wet and disagreeable floor. Their conceptions were acute to all the comforts of life, for we see in all their work comfort and protection so far as it was in their power to secure and apply that which surrounded them.

Number 12 is in Sec. 33, T. 10 N., R. 2 W., on the east side of the river, midway between the west and east quarter-section lines of the southeast quarter, and near the north line of the same quarter. This is the noted Glidewell mound,* which is not only a fortified mound, but was also used for burial purposes. No doubt it has also been used as an observatory or signal mound, from the fact that from the top there is a grand view of the valley and uplands of Wolf Creek. Looking south and southwest, west, and north, can be distinguished mounds 2, 3, 4, 13, 14, 15, 16, 18, 19, 20, 25, 26, 27, 28, 29, 49, 50, 41, 42; workshops 57, 58, 59, 60, 61, 63; cemeteries 64, 65; camping grounds 70, 73, 75; stone graves 54, 55. A fire burning upon this mound could plainly be seen at all these points, and perhaps at others were it not for the intervention of a heavy forest that has grown up since these mounds were constructed. They are all in a line with this mound, and a few of them can be located from the Templeton Fortified Mound No. 2; perhaps all could be were it not for the same intervention.

Number 13 is in Sec. 33, T. 10 N., R. 2 W., midway between the east and west quarter-section lines of the northwest quarter and 40 rods from the north line, on the west side of the river. It occupies a very prominent ridge that projects out to a small creek on the north side that empties into the river on Mr. Alex. Johnston's farm and second terrace formation. This mound is 8 feet high with a base diameter of 40 feet. On top of this structure is a very large maple tree. From this summit, and only thence, are to be seen mounds 51, 52.

Number 14 is in Sec. 32, T. 10 N., R. 2 W., in the northeast corner of the northeast quarter of the section, on the highest terrace formation, also on Mr. Johnston's farm, better known as the Hall farm. This mound is 5½ feet high, with a base diameter of 46 feet. The composition is compact clay.

Number 15 is in Sec. 5, T. 9 N., R. 2 W., midway between the north and south quarter-section lines of the northwest quarter of the section, and 6 rods from the west line, on the highest terrace formation, on the west side of Berris's Creek, on Mr. Chas. Conrad's farm, and in plain view of the Glidwell mound No. 12. This mound is 4 feet high, with a base diameter of 35 feet and composed of compact clay.

Number 16 is in Sec. 32, T. 10 N., R. 2 W., near the corner of the southwest quarter, in the highest terrace formation, north of Wolf Creek and east of a small creek called Monday Branch, on Mr. Phil. Snider's farm. The hill or headland on which this mound is built projects out to this small stream called Monday Branch. The tumulus is 8 feet high, with a base diameter of 60 feet, and composed of compact clay, coal, and ashes. Five distinct strata were encountered, varying from 7 to 20 inches in thickness. No bones of any description were found, nor ornaments or fragments of pottery, in fact nothing that would go to show that it had been used for burial purposes. It was simply a signal mound. Taking the location and surroundings into consideration a better site could not be found on the East Fork of White Water River, one that commands as large a scope of country as this, of both uplands and valley. To the east, west, north, and south, the hill towers above a majority of the surrounding forest, with nothing to obstruct the grand view that is presented to the eye from all points of the compass. One hundred and fifty yards northeast of the mound is an excellent spring of never-failing water. From this mound can be distinguished mounds 12, 14, 15, 17, 18, 19, 20, 27, 28, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 45, 46, 47, 48, 50, 53, 76, stone grave 55, workshops 57, 59, 60, 62.

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* This mound is fully described in the preceding article, with drawings, giving vertical and horizontal sections, and showing position of skeletons exhumed, &c.

Number 17 is in Sec. 13, T. 12 N., R. 13 E., 20 rods from the boundary line, midway between the north and south section lines, and on the south side of a small branch that empties into Monday Branch, second terrace formation, on Mr. Jacob Master's farm. This mound is oblong, 75 feet long, 5 feet high, and 35 feet in diameter at the center. It is simply a heap of fine compact clay; no ashes or charcoal were discovered in trenching it both ways longitudinally and diagonally. It could not have been used as a signal mound, for it is in the hollow of a small ravine, and only to be seen from No. 16.

Number 18 is in Sec. 31, T. 10 N., R. 2 W., midway of the north part of the section, 10 rods from north section line, and near the township line that divides Fairfield and Blooming Grove, on the former boundary line that divided the Territory of Ohio and Indiana. ("This line was established at Greenville, Ohio, treaty in 1795,") and it is also in that territory known as the "Twelve-mile purchase." The mound is on the farm of Mr. Jacob Master, sr., and has been under annual cultivation for the past forty years. Mr. A. Buckley, who settled this farm, informed the writer that when he cleared the timber from the field in which the mound is located, it was then 9 feet high, and surrounded by an embankment, with a deep ditch, evidently from which the material was taken to build the mound and embankment. At the present date the ditch is obliterated, and but a faint ridge marks the outline of the embankments. The remaining part of the mound is 2 feet high, with a base diameter of 45 feet. From this field a great many fine arrows, axes, celts, pestles, &c., have been picked up. In trenching the remaining portion only burnt clay, ashes, and charcoal were encountered. No bones of any description, ornaments, or fragments of pottery were seen. So far back as the time that this field was brought under cultivation, Mr. Herrall has no recollection of ever plowing up so much as a fragment of a human skeleton, nor has the present owner ever observed anything of the kind; therefore this mound also must have been constructed for a signal station.

Number 19 is in Sec. 29, T. 10 N., R. 2 W., in the southwest corner of the southwest quarter, on the highest terrace formatiom, and on Mr. Wilson Jones's farm. This mound, like No. 18, has been under cultivation for a great many years, which has diminished its size considerably, so that at the present time it only measures 4 feet in height, and as to the diameter of these cultivated mounds it is impossible to obtain anything accurate. In trenching no signs of fire occurred. It is simply a heap of compact clay.

Number 20 is in Sec. 29, T. 10 N., R. 2 W., about in the center of the northeast quarter. It occupies the highest terrace formation on Mr. Jno. Kelley's farm, south of the Blooming Grove and Fairfield road, due east from Mr. Kelley's house about 30 rods, and very near the line of his and Mrs. George Miller's farm, just at the apex of the hill that juts up to the ravine running along the base of the hill on the north side. This mound, says Mr. Kelley, was originally 8 feet high, with a base diameter of 50 feet, but with the plow and scraper he leveled it down, so that he could cultivate over it, which he has continued to do for the past twenty years. At the present date it measures 2 feet and 3 inches in height. The portion levelled down was similar in the strata to the remaining portion of the mound. Around this was a ditch and circular wall or embankment, the wall originally was 2 feet high, with the ditch upon the inside. But in leveling it the ditch was filled and the circular embankment destroyed in several places. This circular wall measured 225 feet. In the process of leveling was found a fine copper gorget, which was used to mend a broken shovel-handle. The shovel was purchased and the article removed in a mutilated condition. In trenching the remaining portion of the mound the writer found one fine leaf-shaped spear-point in the *débris* of ashes and charcoal, being somewhat burnt. From this mound can be distinguished mounds 34, 36, 37, 38, 39, 40, 41, 42, 43, 46, 47, 48, 49, 50, 12, 19, 25, in the autumn when the forest is divested of its foliage. No doubt, at one time, judging from the several locations of these mounds, no forest intervened between them.

Number 21 is in Sec. 9, T. 12 N., R. 13 E., in the southeast corner of the southwest quarter of the section, second terrace formation of Duck Creek, and on Mrs. Wilson's farm. The height is 6 feet, base diameter, 36 feet, and the composition, compact clay.

Number 22 is in Sec. 4, T. 12 N., R. 13 E., in the southeast quarter of the section, 60 rods from the north line and 40 from the east line. It is located on Mr. J. Hay's farm, and on the west side of the Blooming Grove and Connersville pike, south side of Duck Creek, near where the pike bridge spans the creek. This is also in the second terrace formation of the creek. Its height is 8 feet, base diameter, 48 feet, and composition, brick clay.

Number 23 is in Sec. 34, T. 13 N., R. 13 E., in the southeast corner of the northeast quarter of the section, on Mr. Milton Trusler's farm, due west of his residence about 20 rods. This mound has been cultivated for several years, long enough almost to obliterate it. It is somewhat difficult to distinguish it from the surrounding surface.

Number 24 is in Sec. 33, T. 13 N., R. 13 E., in the southeast corner of the northeast quarter of the section, near the east line, on Mr. J. Backhouse's farm, and but a few rods from the Blooming Grove and Connersville pike, on the east side. The height is 7 feet, and base diameter 60 feet. This mound also has been under cultivation for several years; perhaps originally it was 10 feet high. It is composed of brick clay.

Number 25 is in Sec. 17, T. 10 N., R. 2 W., near the west quarter section of the southeast quarter, and north of the county line 40 rods. It stands on the second terrace formation that juts out between two small branches or creeks that empty into the river, about 15 rods southwest of the residence of Mr. Jas. Herrall. The tumulus originally was about 5 or 5½ feet high, with a base diameter of 20 feet, but at the present time it measures only 3 feet 9 inches. The diminished height is owing to annual cultivation. Upon being trenched, several fragments of calcined bone, one spear-point, a small gorget, but no pottery or fragments of pottery were found. The remaining portion is composed of four strata of ashes, charcoal, and clay. The fragments of bones, relics, were found in the base or first stratum.

Number 26 is in Sec. 16, T. 10 N., R. 2 W., in the northeast corner of the northwest quarter section, on the second terrace formation of the river, north side of Bloyd's Creek, between the creek and road, due north of Mr. Orlando Campbell's residence 2 rods. The creek during the freshet of June 14, 1882, cut into it about 4 feet. This is a low, flat mound, only 2 feet high, with a base diameter of 46 feet, and that of the apex 40. In trenching, no bones or relics of any description were seen. The mound is composed of fine sand, and covered by a very thin stratum of brick clay. This is the only mound of this description known along the valley or in the territory under investigation. If this was a residence mound, as some would term it, we should find several such mounds grouped together. If this is to be construed as a camping ground or village site, taking the location and surroundings into consideration, the selection was poor and does not correspond with the better judgment exercised by these people in the selection of the sites of their other tumuli. Some contend that these were constructed for the site of the chief's wigwam or building, so as to afford him a better view over his subjects or village, but such arguments are not convincing. The notion that a low, flat mound, only 2 feet high, afforded a much better view is preposterous, when within 40 feet of the mound we come upon the third terrace formation 5 feet higher than the mound itself, affording a far better view and over three times the amount of territory. The mound shows no action of fire, and no remains of any description were found within it. It could not have been a resident mound, a burial mound, or a sacrificial mound. In either case fragments of some kind would have remained to tell its story.

Number 27 is in Sec. 8, T. 10 N., R. 2 W., in the northwest corner of the southeast quarter section, on the highest terrace formation, at the apex of the hill, and on the north side of Bloyd's Creek. East of the mound, about 100 yards, is a small ravine, fed by springs. The tumulus is 7 feet high, with a base diameter of 48 feet. It had been explored to some extent about a year before the work of 1880, and the parties who sunk the pit in the center found, while so doing, a part of a pendant and a small celt, also, a few bones, ulna, radius, tibia, and a portion of the spinal column, but no fragments of the cranium. They, like a great many other curiosity hunters, placed no value on these bones, but threw them out among the brush. The exploration herein described commenced with a trench on the north side, 1 foot below the base, which ran longitudinally through the mound. An unfinished gorget was found, one corner of which having lain in the fire had become calcined to some extent. This ornament and the "finds" of the other parties are made of striped slate. This mound will be fully explored in the near future as opportunity offers, being only 1¼ miles northwest of the village of Fairfield. The construction of this mound is different from that of any other of the numerous mounds explored. No distinct strata occur but patches of ashes and charcoal are interspersed throughout the mound. There have been seven hearths, and the fires kept burning there were intense, for the clay beneath each is burnt to a brick, red and hard, also giving evidence that the fires have been extinguished at different times, and covered over to be rebuilt in another place. The construction of this mound is similar to that on Shaw's Point, on Manatee River, Florida, described by Mr. S. F. Walker. In its use, however, it was entirely different, for no charred animal bones occur, nor were the bones removed by the first explorers in any way burnt. From this mound can be distinguished mounds 12, 28, 34, 36, 37, 38, 39, 40, 41, 42, 43, 46, 47, 48, 49, 50, 76, stone grave 55, workshops 57, 58, 59, 61, 62, 63, cemeteries 64, 65. From off this mound an enchanting scene is presented to the observer in whatever direction he may choose to turn, with the exception of the west. No doubt this would be as beautiful as that to the north, east, or south, were it not for a dense woods that obstructs the view. You have not only a plain view of the valley, but also of the uplands as far as the eye can reach to the east. A fire built upon this mound at any time and in any season of the year, could be plainly seen at all the mounds, &c., specified in the figures given above. We are justified, therefore, in terming this structure not only a burial mound but an observatory, or signal mound as well.

Number 28 is in Sec. 5, T. 10 N., R. 2 W., on the highest terrace formation on Mr. Charles Snider's farm, about 50 yards from the apex of a very prominent hill which is on the south side of Elie's Creek, and back from the river on its west side about 80 rods from the mouth of Elie's Creek. The highest is 4½ feet, and the base diameter, 35 feet. From the field in which this mound is located, and the one due west, many finely made perforators, arrow-points, spear-points, celts, &c., have been picked up from time to time. Mr. Milton Trusler and Mr. Elmer Sheppard have in their cabinets some very beautiful specimens from this locality. In the trenching no bones or ornaments of any description were recovered, but, as usual, the tumulus proved to be a stratified mound, which also may be classified as a signal mound. From this and only this one can be seen mounds 23, 24, 29, 30, 31, 32, 33.

Number 29 is in Sec. 5, T. 10 N., R. 2 W., in the southeast quarter of the section, about the same distance from the east and north section lines. It stands on the south side of Elie's Creek and the west side of the river, about 50 yards from the creek and river, on the second terrace formation, on Mr. Chas. Snider's farm. The height is 3½ feet, the diameter 22 feet. It is composed of sand overlaid with a thin stratum of brick clay. Mr. Snider, in cultivating over this tuumulus has at several times plowed up human bones, but they would crumble as quick as exposed to the atmosphere. In trenching, the writer met with the same trouble of crumbling to dust on exposure. So far as learned, no relics have been found in this mound by any one. Several have dug into it, thus marring the symmetry, and in the course of five or six years there will be nothing left to mark its location, which is the case with a great many of these ancient monuments along this valley.

Number 30 is in Sec. 24, in the southwest corner of the northeast quarter section, T. 13 N., R. 13 E., on Dr. A. C. Fosdick's farm, and on the east side of a small creekthat empties into Elie's Creek. It occupies the highest terrace formation of Elie's Creek. The height is 8 feet and the diameter at the base, 28 feet. This mound has a pit sunk in the center about 5 feet square, concerning which nothing is known. The mound is composed of compact clay stratified.

Number 31 is in Sec. 14, T. 13 N., R. 13 E., Fayette County, in the southwest corner of the northeast quarter section, on Mr. John Dungan's farm. It stands on the north side of the same creek as No. 30, northwest of Mr. Dungan's residence about 150 yards. This mound is 7½ feet high and 46 feet in base diameter. It has been partly explored by some one who commenced a trench on the west side 5 feet wide, and dug to the center of the mound. The sides of this trench reveal the composition throughout. The mound stratified and composed of brick clay. From the field in which this mound is located several species of aboriginal handiwork have been picked up.

Number 32 is in Sec. 14, T. 13 N., R. 13 E., in the northwest corner of the northeast quarter, about 20 yards from the north section line and 75 yards from the west quarter-section line. It stands in the center of a fine maple grove, on Mr. Asbury Henson's farm. The height is 11 feet, and the base diameter 57 feet. This mound, like No. 30, has a pit sunk in the center. Fifty yards to the northwest of the mound is a large circular pit, from which, no doubt, the material used in the construction was taken. On the mound are three large maple trees, and on mound 31 are two maple and a beech tree. The material is compact clay.

Number 33 is in Sec. 25, T. 11 N., R. 2 W., in the southeast corner of the northwest quarter section, in Union County, northwest of Roseburgh 500 yards. It stands on the east side of Hannah's Creek, about 400 yards distant, and on second terrace formation, on Mr. Hayworth's farm. This mound is 15 feet high, with a base diameter of 65 feet, and is considered the largest mound in Union County. Riding over it with a horse or pounding on the apex produces a hollow sound. The supposition among the villagers is that it is not solid. No doubt this is a sepulchral mound.

Number 34 is in Sec. 3, T. 10 N., R. 2 W., about midway, near the east section line of the northeast quarter section, on the east side of Hannah's Creek, and on the highest terrace formation. It is located on Mr. Andy Sutton's farm, northwest of Santaannahsburg a little over a half mile, and on the west side of the road that runs from the burg across to Hannah's Creek, and 300 yards a little northwest of Mr. Sutton's residence. This mound is 14½ feet in height, with base diameter of 60 feet, unexplored.

Number 35 is in Sec. 33, T. 11 N., R. 2 W., in the southeast corner of the northeast quarter-section, on the highest terrace formation of the river, 40 rods from the east section line, and 75 or 80 yards from the south quarter-section line. It is on the north side of the road and about 150 yards north of Mrs. Hughes's residence, on Mr. Jas. Wilson's farm. The height is 4 feet, base diameter 38 feet; the material is brick clay.

Number 36 is in Sec. 34, T. 11 N., R. 2 W., on the line that divides the northwest and southwest quarters, and 60 yards from the west section line, on Mr. Israel Martin's farm. It stands on the highest terrace formation of the river, east of Mrs. Hughes's residence about 100 yards. The height is 4½ feet, and the base diameter 38 feet. This mound has been trenched from the west side to the center, and Mr. Geo. Hughes, who lives in close proximity, states that there have been taken from this mound several nice copper and striped slate ornaments, and human remains, in a very good state of preservation. Like a great many others who destroy these ancient tumuli, however, merely to satisfy a morbid curiosity, placing no value upon these old and partly decomposed bones, "he threw aside" that which the student as well as the scientist value as highly as the relics found with them. Thus it is, in every community, a class of people exist, to place hinderances in the way of investigators.

Number 37 is in Sec. 34, T. 11 N., R. 2 W., about half way between the east and west quarter section lines of the northwest quarter, and 10 rods from north section line. It is located on the highest terrace formation of the river, on Mrs. Lewis Hugh's farm. Its height is 4½ feet, and base diameter 35 feet. It is unexplored.

Number 38 is in Sec. 3, T. 10 N., R. 2 W., in the northwest corner of the northwest quarter, about equal distance from the north and west section lines, on the highest terrace formation of Hannah's Creek, and on Mr. Jerry Sample's farm. The height is 4 feet, and the base diameter 28 feet. It is unexplored.

Number 39 is in Sec. 3, T. 10 N., R. 2 W., in the southwest corner of the northwest quarter, about equal distance from the west section line and south quarter-section line. It stands on a very prominent hill that juts out to Hannah's Creek, where it and Dubois Creek join. From this mound can be distinguished Nos. 36, 37, 38, 40, 41, 27, 28, workshops 60, 62.

Number 40 is in Sec. 4, T. 10 N., R. 2 W., in the northeast corner of the southeast quarter, about 10 rods from the east section line, and 12 rods from north line of the quarter, on the highest terrace formation of both the river and Hannah's Creek, and on Mrs. Scott's farm. Unexplored.

Number 41 is in Sec. 9, T. 10 N., R. 2 W., in the northeast quarter of the section, southwest of the township school-house 508 yards, on Mr. Alex. Johnson's farm, and southeast of his residence 300 yards, on the highest terrace formation of the river. The height is 5 feet, and the base diameter 40 feet. From this mound can be distinguished Nos. 27, 28, 29, 38, 39, 40, 42, 43, workshop 60. Unexplored.

Number 42 is in Sec. 9, T. 10 N., R. 2 W., in the northeast corner of the southeast quarter section, on the second terrace formation, and on the south side of a small stream called Hollingsworth's Creek. It stands only a few rods east of Mr. Henry Master's spring-house, also southeast of his residence about 400 yards. The height is 4½ feet, and the base diameter 32 feet. It is composed of compact clay.

Number 43 is in Sec. 9, T. 10 N., R. 2 W., about midway between the south section line and the north quarter section line, and in the southeast quarter of the section, due south of residence about 500 yards, on the same farm, and on the second terraced formation. This mound is oblong, and is 3 feet high, its longest diameter being 42 feet, its shortest 20 feet. Mr. Enoch Hollingsworth, who owned this farm years ago, at his leisure moments trenched it from east to west, and in doing so removed several fragments of human bones, a few arrow-points, and one stone ax, which were thrown aside as valueless.

Number 44 is in Sec. 24, T. 10 N., R. 2 W., in the northeast corner of the northeast quarter section. The east section and township line touches the base of the mound on the east side. It is south of the north section line just 8 rods, and northwest of Mr. Thomas Flood's residence 40 yards. This mound has been under cultivation annually for the past fifty years; therefore as to its original height there are no means of judging. From this mound have been taken a fine pipe, several arrows, spear-points, and ornamental stones, all of which were given to persons who were making a study of these prehistoric relics.

Number 45 is a stone structure in Sec. 23, T. 10 N., R. 2 W., in the northeast corner of the northwest quarter section, 10 rods south of the north county line, 20 rods west of the east quarter-section line, on the west side of a small branch or creek that empties into the north branch of Templeton's Creek. This is the most peculiar stone structure in the valley. The east half has been destroyed by the branch undermining the bank, and letting it down about 6 feet to the bed of the creek. This structure was examined very minutely. Judging from the remaining half, and allowing both sides to have been equal in width and length, we may form some idea of its character. The height of the wall and altar is the same, measuring just 2 feet. It is an easy matter to conjecture the use for which this peculiar structure was erected, but a more difficult task to establish opinions as facts. There is an altar surrounded by a wall. Whether this was a sacrificial altar or one upon which had been erected an idol cannot be known. The center is not raised above the surrounding walls. The stone covering the top was once in one solid piece, but now broken, and was perfectly smooth on its upper surface. It does not show any action of fire. Mr. Joseph Miller, who first called attention to it, and others, could not imagine for what purpose it was constructed. This was a great curiosity during the days when the noted Bath Springs were a resort of the people from a distance as well as those of the surrounding country. Crowds would visit this structure and speculate upon its probable use and constructors.*

Number 46 is in Sec. 15, T. 10 N., R. 2 W., in the southeast corner of the southeast quarter section, 4 rods from the south section and county line that separates Franklin and Union Counties, 8 rods from east section line. It stands on the south side of Bath Creek, 40 feet from the bank, at the foot of a small hill in the woods, on the third terrace formation of the river, and on Mr. Noah Newkirk's farm. On the north side and also on the east side, about midway of the apex and base, are growing two large beech trees. Mound, height, 3½ feet; base, diameter, 30 feet; composition, compact clay.

Number 47 is in Sec. 22, T. 10 N., R. 2 W., in the northeast part of the northeast quarter section, on the south side of Bath Creek, and on third terrace formation of the river, located on Mr. Amos Cary's farm. The height is 5 feet; base diameter, 35 feet; composition, compact clay.

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* Since the above was written Mr. Joseph Miller states that during the freshets of June 13, 1882, the creek, near whose bank it was situated, overflowed. The current, being swift and destructive, completely destroyed the remaining part of the structure by undermining the bank and tumbling the whole into the creek. Thus it is, one by one, these old remains are becoming removed.

Number 48 is in Sec. 22, T. 10 N., R. 2 W., in the southwest part of the northeast quarter section, on the south side of Bath Creek. It occupies the highest terrace formation of the river, about midway between the creek and the road to the south that leads from Fairfield to Colter's Corner and Oxford. It is located on Mr. Amos Cary's farm. The height was originally 6 feet and base diameter 40 feet. This mound has been under cultivation for the past half century. The author remembers very distinctly going twenty-two years ago, in company with a cousin, and gathering pockets and hats full of fine arrow-points and spear-points from this mound, carrying them to the house, after which they amused themselves by striking them together to see the sparks fly. Even recently have been secured fine specimens of arrow-points, spear-heads, two or three very good axes, several fine celts, and three discoidal stones, the largest weighing eight pounds and six ounces. In digging from west to east a trench 6 feet wide, nothing was found in the shape of ornaments or domestic implements, but a stratum of ashes, coal, and burnt clay.

Number 49 is in Sec. 16, T. 10 N., R. 2 W., in the southeast quarter section, about midway between the north quarter and south section and county lines. It is 10 rods from east section lines, on the third terrace formation, on Mr. John Sim's farm. This is an oblong mound, height, 3½ feet; longest base diameter, 40 feet; shortest, 20 feet; composition, compact clay. From this mound can be distinguished Nos. 20, 25, 26, 27, 28, 53.

Number 50 is in Sec. 27, T. 10 N., R. 2 W., in the northeast part of the northeast quarter section, about 20 rods from the north section line, the same distance from the road on the south of the mound, and northeast of Mr. C. Master's residence, on whose farm it is located. It lies south of a small stream called Blue Lick, which empties into Bath Creek, and is in the woods about 60 rods from the creek. The height is 5 feet 9 inches; base diameter, 25 feet; composition, burnt clay, coal, and ashes. On the north side of the mound is a large beech tree, whose roots permeate the mound. This tumulus, in construction, is similar to No. 12 in being a protected mound. No. 12 is covered with flat shelly limestone; this, with cobble-stones. The strata are five in number, the protecting rock, or cobble-stone covering, varying from 5 to 12 inches in thickness. The stones were laid symmetrically from base to apex, and were all calcined; the silex and quartz by the confined heat had become vitrified. This was accomplished by overlaying the rock covering with a heavy deposit of compact clay, thereby confining the heat; but the most difficult problem is how the savages accomplished the feat of arranging these bowlders so evenly while such an intense fire was burning. What was the object in thus protecting such a mound is difficult to say, unless it was for the cremation of the dead. Upon sinking a shaft in the center below the level of the mound, or in digging a trench 6 feet wide from the west to the east side, not a fragment of bone, pottery, or any implement appeared. It was simply a pile of calcined rock, intensely burnt clay, ashes, and coal. Judging from the vast amount of broken arrow-points, spear-points, and celts, in the field near mound 51, a terrific conflict must have raged upon this spot, and it may be that the conquerors heaped up their dead or those of their enemies and cremated them upon the spot where this mound of ashes, coal, and calcined rock now stands. It was not used as a signal mound, for several reasons: First the builders would not have expended their labor in gathering these cobble-stone and protecting it as they have done for such a purpose. Second, the location is not suitable, for all signal stations or mounds are located on the most prominent points, clear of all obstructions. Nor is it a kitchen mound, there being no fragments of bone, pottery, &c. Therefore this must have been a funeral pyre.

Number 51 is in Sec. 27, T. 10 N., R. 2 W., in the northwest corner of the northeast quarter section, on the highest terrace formation, about 6 rods from west section line and almost due west of number 50. It lies a little northeast of Mr. Jon. Hugh's residence, on whose farm it is located. This mound has been under cultivation for the past half century. Under the turning process of the plow and scraping and dragging of the harrow during all this time, one finds it impossible to form any idea of its original height. At the present time this one is 2 feet 10 inches high. From the field in which this mound is located a great many arrow-points, pestles, axes, bark-pealers, scrapers, etc., have been picked up from time to time, of which a great majority were broken.

Number 52 is in Sec. 27, T. 10 N., R. 2 W., in the northwest part of the southeast quarter section, on the highest terrace formation, due south of number 51, near the woods, on Mr. Jon. Hugh's farm. The height is 4½ feet; base diameter, 35 feet; composition, compact clay.

Number 53 is in Sec. 20, T. 10 N., R. 2 W., in the northwest part of the northwest quarter section, near the head of a stream called Herralls' Branch, on the highest terrace formation, due north of Mrs. Hayworth's residence, on whose farm it is located. The height is 4 feet; base diameter, 25 feet, and composition, compact clay.

Number 76 is in Sec. 27, T. 10 N., R. 2 W., in the northeast corner of the southwest quarter section, on the highest terrace formation, and on Mr. A. C. Carter's farm. The height is 3 feet; the base diameter, 20 feet, and composition, compact clay.

Number 77 is in Sec. 23, T. 10 N., R. 2 W., in the southwest corner of the southwest quarter section, on the highest terrace formation, on Mr. R. Wortman's farm, at the head of a small stream called Blue Lick, which empties into Bath Creek. The mound is on the east side and almost due south of the old log cabin that still stands on the south side of the farm. The height is 4½ feet; base diameter, 28 feet; and composition, compact clay.

Number 78 is in Sec. 28, T. 11 N., R. 2 W., about the center of the southwest quarter section, on the second terrace formation. It stands a little northwest of Quakertown, on the east side of Bond's Creek, about 80 yards distant. The present height is 3 feet, and base diameter, 60 feet. Mr. Hugh Abernathy, among the first settlers of this valley, states that, sixty years ago, this mound was about 18 feet high, and made of fine sand, which the older citizens of Quakertown and Dunlapsville hauled away for building purposes. The remaining portion does not look like the remnant of a mound.

Number 79 is in Sec. 31, T. 14 N., R. 14 E., in the northeast corner of the northwest quarter section, on the third terrace formation, on Mr. Hugh Abernathy's farm. The height is 8 feet; base diameter, 45 feet, and composition, compact clay.

Number 80 is in Sec. 2, T. 11 N., R. 2 W., in the northwest part of the northeast quarter section, on the highest terrace formation, on the Leviston farm. It stands about half way between the Junction Railroad and Liberty and Brownsville pike, and about 4 rods from a never-failing spring, which is a little northwest of the mound. The mound has been under cultivation for a great many years, which has greatly diminished it in height.

Number 84 is in Sec. 5, T. 11 N., R. 2 W., in the northwest part of the southeast quarter section, and on the second terrace formation of Hannah's Creek, on Mr. Henry Ruse's farm. The height is 6 feet; base diameter, 42 feet; composition, compact clay.

The fragments of pottery which have been found in the exploration of the several mounds that are distributed along this valley (no complete vessels have been recovered) are composed of potter's clay, sand, and pounded shell. In the process of burning, a portion of the sand became vitrified and the shell calcined. By the aid of the microscope it was possible to find out the composition of each fragment, yet these would crumble with the least handling. The mysterious people who constructed these mounds must have exercised a great deal of care in removing the larger pebbles from the dirt, since those composed of clay or sand show a very few pebbles as large as a good sized marble. This fact has been often verified by the author, who ordered his helpers to notice critically every particle of dirt handled in the process of trenching or sinking a pit. Mounds from 20 to 60 feet in diameter have been trenched without finding as many as a dozen pebbles. It is not for the want of pebbles in the surface soil, for they are plentiful and can be gathered by the bushel. It is not that the material has been brought from a distance. Ninety-nine of every hundred mounds are heaped up from the surrounding soil, and seasons of rain-fall, freezing and thawing, growth and decay have filled up these places, so that the surrounding surface presents the appearance of never having been disturbed. How much higher these tumuli were originally we have no means of knowing; the same changes will diminish the height of these monuments with each succeeding year.

Number 54 is a group of stone graves in Sec. 10, T. 9 N., R. 2 W., in the northwest corner, near the north section line of the northwest quarter section, on the third terrace formation of the river. It is situated north of a small stream that runs through Mr. James Logan's farm. Mr. James Rucker, in company with Mr. Logan, some years ago, excavated them, but in doing so only found a few fragments of decayed bones. Mr. Logan also states that the field in which these graves are located was formerly covered with arrow-points, but the process of plowing, rolling, and harrowing has broken them into fragments; yet a great many are still picked up by the children from time to time.

Number 55 is also a stone grave in Sec. 16, T. 10 N., R. 2 W., about midway between the north section line and the south quarter-section line, and in the northeast quarter section. It stands about 4 rods from the east section line, on the brow of a very high hill that is covered by heavy timber. In digging into this grave a few fragments of bone were found, a portion of the humerus, ulna, radius, and femur, the outer plates of the cranium, which was as thin as paper, the inner being entirely decayed.

Number 64 is a cemetery in part Sec. 29, T. 11 N., R. 2 W., on the highest terrace formation, and on a prominent ridge that projects out to Bond's Creek, on the west side, on Mr. Jackson Leeche's farm. Five years ago, in the neighborhood in which this cemetery is located, the road supervisor, in his search for gravel, by chance stumbled upon the point of this ridge, which he commenced to remove. After digging and caving down the ridge about 8 feet from the point of commencement, the workmen came upon and removed four skeletons with a few stone-axes, one of which, 8 pounds in weight, is in the author's cabinet, and one of about the same weight is in the cabinet of the Natural Historical Society of Cincinnati. At that time also a few celts were found with these skeletons. A great portion of the skeletons crumbled to pieces upon exposure to the air. One cranium was nicely put together by Mr. Stanton, who has it yet in his cabinet. The depth of the interment was 7 feet.

Number 65 is a cemetery in Sec. 4, T. 9 N., R. 2 W., in the southwest corner of the southeast quarter section, on a ridge that projects out to a small stream which empties into the river. It is situated on the east side of the river, on the second terrace, a little southeast of the river bridge, on Mrs. K. Templeton's farm. Over it has grown a small forest, which obscured the fact that it was a resting-place of the dead. There are only four places within a range of 11 miles—these two cemeteries and the stone graves—where the dead were buried in this manner.

Number 56 is an open-air workshop in Sec. 3, T. 9 N., R. 2 W., in the southeast corner of the southwest quarter section, on the second terrace formation of the river, in a field on the north side, through which runs a small stream fed by numerous fine springs. This workshop is but a short distance southwest of the group of stone graves.

Number 57 is an open-air workshop in Sec. 4, T. 9 N., R. 2 W., near the southeast corner of the northwest quarter section, on Mr. George Templeton's farm. It is situated on the second terrace formation of the river, south of Templeton's Creek about 300 yards, and 150 yards south of his residence. The gentleman states that he has found a great many axes, pestles, celts, and arrow-points on this piece of land, and from a spot about 200 feet square has hauled at least sixty wagon-loads of chipped and unchipped cobble-stones, and yet as many loads remain. Mr. Templeton has in his possession an ax taken from this shop, the most perfect one the writer has examined.

Number 58 is a workshop in Sec. 12, T. 10 N., R. 2 W., in the northeast corner of the southwest quarter section, on the second terrace formation, and in Mr. Charles B. Hayward's farm. It stands almost opposite the noted Glidwell mound, and on the west side of the river, in plain view of No. 57. To the northwest of the field in which this shop is located are several never-failing springs, whose water forms quite a stream, which flows along the north side and empties into the river. Here can be found a vast amount of chert chips, chert balls, broken and chipped cobble-stones, and broken arrow-points. The implements that predominate are the scrapers, axes, sinkers, hammer or chipping-stones. A few ornamental pieces have been found. The author has gathered and received from Mr. Hayward at least a bushel of relics. And every year when this spot of ground is turned over hundreds are picked up by the owner and given away, yet, from among the vast number, not one pure flint-point has been found.

Number 59 is a workshop in Sec. 17, T. 10 N., R. 2 W., in the southeast part of the northeast quarter section, on the second terrace formation of the river, on Mr. James Herrall's farm, a little east of north from his residence, and close to the road, on the east side of the field in which it is located. East of the field is a fine spring of water, and near by in the field is the workshop, about 300 feet square. Here were manufactured the ornamental or ceremonial pieces, for every year that this spot is cultivated several implements are picked up in an unfinished or finished state. Some are only chipped into form, some chipped, pecked, and partly ground; others completed, with the exception of drilling, which in some cases is commenced; others are entirely finished. A few celts and chipping-stones have been found, but they do not seem to be very numerous.

Number 60 is a workshop in Sec. 9, T. 11 N., R. 2 W., on the southwest corner of the northwest quarter section, on the second terrace formation of the river, and on Mr. Alexander Johnston's farm. The spot covers about 4 or 5 acres, constituting the area of the plateau over which the work was prosecuted. The articles of manufacture were axes, celts, and pestles. From this spot have been gathered quite a number of these domestic implements, with a few ornaments, by Mr. Theodore Campbell, S. Conrad, H. Brown, James Mills, and others. Quite a number of large axes, weighing from 10 to 16 pounds, have been found here. Mr. James Rucker has one in his cabinet with about 4 inches of the bit broken off, found by Mr. Henry Brown, that weighs, as it is, 12½ pounds. No doubt before it was broken it would have weighed 16 pounds. The author has one in his cabinet, made of striped slate, plowed up on the 26th day of August, that weighs 10 pounds. Mr. Theodore Campbell gave the author a mortar that holds very near a half gallon, the finest specimen of the kind he has ever seen. It was plowed up in 1848, by Mr. Taylor, "a former owner of this farm," who at that time picked the date on the bottom of it. Very few arrow-points are found on this farm or those joining it on the north, east, or south. Through the field in which this shop is located an old Indian trail passes to an Indian camping-ground due west, about 200 yards. Some of the older inhabitants of this and that neighborhood still recollect some of the incidents that transpired at this camp while the aborigines yet roamed at will up and down this valley.

Number 61 is a workshop in part, Sec. 29, T. 12 N., R. 2 W., on the second terrace formation of the river, and on Mr. Levi Bond's farm, just north of his residence, about 300 yards. It is about 500 yards northwest of Quakertown, on the north side of the road that leads from Quakertown to Alquina; also on the west side of Bond's Creek. A little to the south is an excellent spring of pure water running the whole year round. A little northeast of this shop was the once great sand mound spoken of. The articles of manufacture of this shop were the ax, pestle, celt, and hammer-stone. This was one of the most productive shops along the valley. There has been gathered here, from time to time, at least a half wagon load of domestic implements, and yet every year that this field is cultivated Mr. Bond or his sons pick up about two dozen implements. Almost every cabinet in this section and that of the State museum contains typical specimens taken from this notorious workshop which covers about 2½ acres. This space is covered with a mass of chipped and broken stones; but to my knowledge or that of Mr. Bond's, no ornamental piece has yet been found within the field in which these remains are located. Northwest of this, a quarter of a mile, is a cemetery which will be mentioned further on.

Number 62 is a workshop in Sec. 4, T. 11 N., R. 2 W., in the northwest part of the southeast quarter section, on the second terrace formation of the river, and on Mrs. E. Scott's farm. It stands northeast of her residence and on the north side of Hannah's Creek. The articles of manufacture have been pestles and celts, those implements predominating. But very few axes have been found here. The area of this shop is about 1 or 1½ acres. A vast amount of broken cobble-stone covers the spot. Very little of the striped slate-stone is found here. No ornaments or fragments thereof has ever been discovered on this piece of land, arrow-points also being very few in number. Occasionally one is picked up in the spring or fall of the year, when plowing is going on.

Number 63 is a workshop in Sec. 21, T. 12 N., R. 2 W., in the northwest corner of the southeast quarter section, on the second terrace formation of the river, and on Mr. Harrison Erb's farm. It stands on the west side of the river, also on the west side of the road that leads from Dunlapsville to Brownsville. A little northeast of this workshop is an excellent spring, which has never been known by the oldest settler to fail in supplying an abundance of water. The articles of manufacture at this shop were axes, pestles, celts, and hammerstones, or, as some would wish to classify them, sinkers. From this shop, which covers an area of about 2 acres, quite a goodly number of these domestic implements have been taken. Only two or three ornamental pieces have been found here, and those were broken or unfinished. A great many of the domestic implements have also been found in this condition.

Number 66 is a workshop in Sec. 36, T. 13 N., R. 13 E., in the northwest part of the southwest quarter section, on the highest terrace formation, on Mr. Jacob Master's farm, a little northwest of the residence and on the north side of Bloyd's Creek. To the south of this shop is a fine spring of water. The predominant articles of manufacture were arrow-points, scrapers, and drills. Seldom an ax, celt, or pestle is found here, but a great many arrows, with which the several local collectors have enriched their cabinets. They are principally made of chert; occasionally a specimen of chalcedony or of flint occurs.

Number 82 is a workshop in Sec. 20, T. 10 N., R. 2 W., in the southwest part of the northwest quarter section, on the highest terrace formation, and on Mrs. Agnes Miller's farm, north of her residence about 100 yards. To the south of this shop is a fine spring of water. Articles of manufacture are arrows, spear-points, and scrapers. The area of the shop is about one-half acre, which is thickly covered with fragments of chert. A great many fine arrow-points have been found here by Mrs. S. B. Johnston's sons, who make a business of collecting these relics and selling them to the several local collectors.

Number 83 is a workshop in Sec. 27, T. 13 N., R. 13 E., in the southwest part of the southeast quarter section, on the highest terrace formation, on Mr. Jacob Meyer's farm, northwest of his residence about 75 yards. East of the shop about 100 yards is a good spring of water, which flows directly along the south side of the field in which the shop is located. Articles of manufacture are arrow and spear points, although a few fragments of ornaments have been found and two "anvils." The area covered by the shop is 1½ acres. Here we find the ground covered with chips of chert, with occasionally a few fragments of flint and chalcedony. This shop has also furnished several local collectors with a fine assortment of arrow-points. So far, not a single ax, celt, or pestle has been found on this shop or even on the farm.

Number 85 is a workshop in Sec. 10, T. 12 N., R. 13 E., in the northern part of the southeast quarter section, on the highest terrace formation, and on Mr. Jon. Webb's farm. Articles of manufacture are axes, celts, arrow and spear points. Here a profusion of articles have been found, along with some fragments of ornaments. Mr. Webb and his sons, in the process of tilling this field, have secured a vast amount of the arrow-points, some of them very fine specimens. The shop covers about 2 acres of ground. In the writer's cabinet is a sledge which Mr. E. Webb gave him in the spring of 1880, turned over in the process of plowing. This sledge weighs 22½ pounds; the groove being complete, also the pole, the bit being chipped and pecked down ready for grinding. This is an excellent specimen. Every year when tilling the field in which this shop is located the owners secure a goodly number of relics. In the adjoining field on the north the oldest settlers say there was an Indian camping-ground, and the trail passed through the northeast corner portion of the field in which this shop is located.

The old block-houses which were erected along the valley some seventy-five years ago have nearly all been removed, and the spot where they once stood will soon be unknown. The old settlers are passing away rapidly, and they alone retain their history. Here in this valley they settled down in 1803 and 1804, in somewhat compact colonies, and erected these forts for preservation in time of danger from the then savages. Of these but two remain, one on Mr. William McClure's farm, a little northeast of Brookville, No. 89; the other on Mr. Jon. Power's farm, No. 81. This was weather-boarded and converted into a dwelling, and has been occupied as such up to the present time, but the owner contemplates its removal. Thus the last one of these forts whose rude walls had protected our first inhabitants from the deadly arrows of the red men will be gone to give place to a more commodious dwelling

Block-house No. 67 is in Sec. 28, T. 12 N., R. 2 W., and in the southeast corner of the northwest quarter section, on the east side of the village of Dunlapsville. This block-house was erected by Mr. William Nickles in 1806.

Block-house No. 68 is in Sec. 30, T. 14 N., R. 14 E., in the southwest corner of the northeast quarter section, and just opposite the mouth of Richland Creek. It was erected in 1805.

Block-house No. 81 is in Sec. 33, T. 10 N., R. 2 W., in the southwest corner of the southwest quarter section, erected by Obadiah Eustes, in 1804.

Block-house No. 87 is in Sec. 21, T. 9 N., R. 2 W., near the southwest corner of the northwest quarter section.

Camping-grounds and trails have been laid down on the map and sectional drawings as correctly as it were possible. To accomplish this has been quite a task and involved writing to a great many who are acquainted with facts, who do not now reside within the county. The greater portion of the knowledge thus gained was from the oldest inhabitants who were born and raised in this community.

No. 69 is in Sec. 31, T. 10 N., R. 1 W., in the southwest corner of the southwest quarter section.

No. 70 is in Sec. 33, T. 10 N., R. 2 W., in the northwest corner of the southwest quarter section.

No. 71 is in Sec. 10, T. 12 N., R. 13 E., near the southwest corner of the northeast quarter section.

No. 72 is in Sec. 36, T. 13 N., R. 13 E., very near center of the section.

No. 73 is in Sec. 8, T. 11 N., R. 2 W., southeast corner of the northeast quarter section.

No. 74 is in Sec. 11, T. 11 N., R. 2 W., in the northeast corner of the southwest quarter section.

No. 75 is in Sec. 7, T, 14 N., R. 14 E., in the southwest corner of the southwest quarter section.

No. 86 is in Sec. 34, T. 13 N., R. 13 E., midway between the east and west quarter-section lines, and near the north line of the northeast quarter section.

OPEN-AIR WORKSHOPS.

These shops are discovered in the valleys under the uplands by evidences as positive as those of the mounds and earthworks, and perhaps more so than those of the mounds, from the fact that a great many persons are misled in regard to these elevations, ever ready to call any symmetrical hillock a mound. Only a section will disclose the truth as to their natural or artificial formation. Not so in regard to these ancient workshops. If by chance one should, while passing over a field or piece of ground, come upon a vast amount of broken cobble-stones or chert, unable to find hardly one intact, he naturally would conclude that here some kind of industry had been carried on. A true knowledge of that branch of industry would be found out by any inquiring mind. If among these spalls or fragments we find an ax, celt, or pestle, and upon due inquiry of the owner or tenants ascertain that he at different times had gathered several of these different implements there we could surely say, this is a workshop where were manufactured only this peculiar class of implements. Wherever these fragments are found there is no difficulty in classifying the style of implement which were manufactured, whether they be the ax, celt, pestle, hammer, arrow, or ornament; the superabundance of each article tells the story. Sometimes we find a variety of implements, such as the ax, celt, arrow-points, &c. In such instances there will be found a conglomeration of fragments. But such is seldom the case, and only one shop of this character is known along this valley; this is No. 59, in Sec. 17, T. 11 N., R. 2 W. Here are found the warlike and domestic implements in conjunction with ornaments, all of which have been found in goodly numbers in their finished and unfinished state; some chipped into form, others chipped and partly pecked; others again showing three stages of advancement, chipped, partly pecked, and partly ground or polished. Such is not only the case with the ornamental finds, but also the axes and celts show the same stages of advancement. These workshops, as a general rule, are located on the second terrace formation along the river or the larger streams that empty into the river, and in close proximity with each shop is an excellent spring of water. Also in close proximity will be found a signal mound or station, located on the highest hill or bluff along the river. Mound 12 commands an excellent view of Nos. 56, 57, and 58; mound 25 that of No. 59; mound 27 that of shop 60; mound 41, that of 62; mound 79, that of 63; mound 21, that of 85; and so on, through the whole valley. 'Tis true these signal mounds in some instances have been converted or adopted as burial mound, probably after their abandonment as signal stations. We are better able after trenching these structures through the center to determine their true character and probable use. Until this is done our theories are premature, for only a true section of their formation can establish the facts as to whether they are signal mounds or burial mounds or both. In signal mounds there is only one spot, and that in the center, that shows the action of fire, and when it has served its purpose it is built up in a cone shape and abandoned. In case it is converted into a burial mound the fire has been extinguished, the surface leveled, the dead deposited, and again another layer of clay or whatever material is used in its construction is symmetrically laid over the dead to the depth of 6 to 18 inches. Over the whole surface a fire once more is started, the object being to burn the clay or harden it, so that the water will not permeate it so readily as it does the unburnt clay. In doing this there is no fear of destroying the objects deposited below. Sometimes where a limb has not been sufficiently covered it has been charred, which accounts for that part of the subject we oftentimes find in these tumuli that are mutilated and attributed to cremation. The moisture that is contained in the body preserves the bones of these subjects from the intrinsic action of the fire.

In studying the reports of the survey of mounds in certain portions of the country, by those who have classified them as signal and burial mounds, the question often presents itself, by what criteria are they asserted to have been signal stations or otherwise? The writer has followed in their footsteps heretofore in his classification, description, surveys, &c. In the present paper the theory of their past usage is based on the appearance of their strata, after a perfect section of the mound is made, not from the strata shown in sinking a shaft in the center, for, perhaps, these strata may extend to within 6 inches of the outer edge of the structure or tumulus, and perhaps they may not; hence the advisability of a perfect section of the works so as to enable one to classify them correctly. This has been done in this present report as far as it was possible to superintend the work. These signal and burial mounds develop the fact that their builders looked to the safety of the living and to the preservation of their dead, and adopted the most rational means at that time, taking into consideration their surroundings and facilities. They could not, with all their shrewdness, have hit upon a more preservative mode—the ashes and coal for the bed of the sleepers, and the hard burnt clay as their covering. Under such circumstances it required years for these bodies to molder away. Perhaps where these mounds stand forests have grown up, fallen, and decayed to give place to other species, and yet a goodly portion of the skeletons are exhumed from these tumuli in a good state of preservation. The people who once occupied this land have had their turn, and in the most joyous career of their vanity and splendor their strength failed, and they have again returned to dust. Therefore the whole world is but a sepulcher, and there has nothing lived on its surface but has been entombed beneath it. The mounds and obscure cemeteries all over the world are full of this loathsome dust of bodies once quickened by living souls, who perhaps occupied thrones, presided over assemblies, marshaled armies, and subdued provinces.

Mounds surrounded by circular walls are scattered along the valley and on the hill-tops that command a view of the greatest territory; those in the valley generally stand on the second terrace formation, near the greatest prominence.. Why are the circular walls thus built? Is it to mark the peculiar purpose for which they were constructed, as signal, crematory, or sacrificial. Perhaps these walls were built to serve the purpose to which have been attributed the smaller circular works without any center elevation. All the lesser works of this character were probably constructed for the same purpose as mentioned heretofore. They are the remains of a primeval wigwam, it may have been of a religious character, or one in which the royal chief and family dwelt. Exploration does not develop anything positive. It is seldom that any fragment of bone is found. When such is the case it is of an animal, but the species cannot be determined. Generally fragments of pottery are found throughout the work, but domestic implements are seldom found. If such be the case it will be only a fragment. Another noticeable feature is that these structures contain no ornamental or ceremonial stones. If one is allowed to judge from the material that is found within them, of a domestic character, they would be classed as kitchen mounds, containing more fragments of plain domestic pottery than anything else. They cannot be works of defense, for they are too small, measuring only 40 to 80 feet in diameter. These circular works were simply the protection walls of a wigwam or temple, perhaps of religious character. Nothing can be more obvious than that they were built in accordance with a general plan and for a specific purpose. When, however, a conclusion is sustained by analogies of a most striking character, it is invested with double value. It is then that we proceed with some degree of confidence to inquire how far we are justified in supposing that these ancient structures were temples of worship, or palaces for the chief ruler. It is true, we have neither the light of tradition nor that of history to guide us in our inquiries. Even the name of the people by whom these works were constructed is lost. Therefore every attempt to draw aside the curtain that separates myth from truth may fail, but if this investigation is but partially successful in casting a ray of light upon these mystical structures, the labor will not have been in vain.

SIGNAL MOUNDS OF BUTLER COUNTY, OHIO.

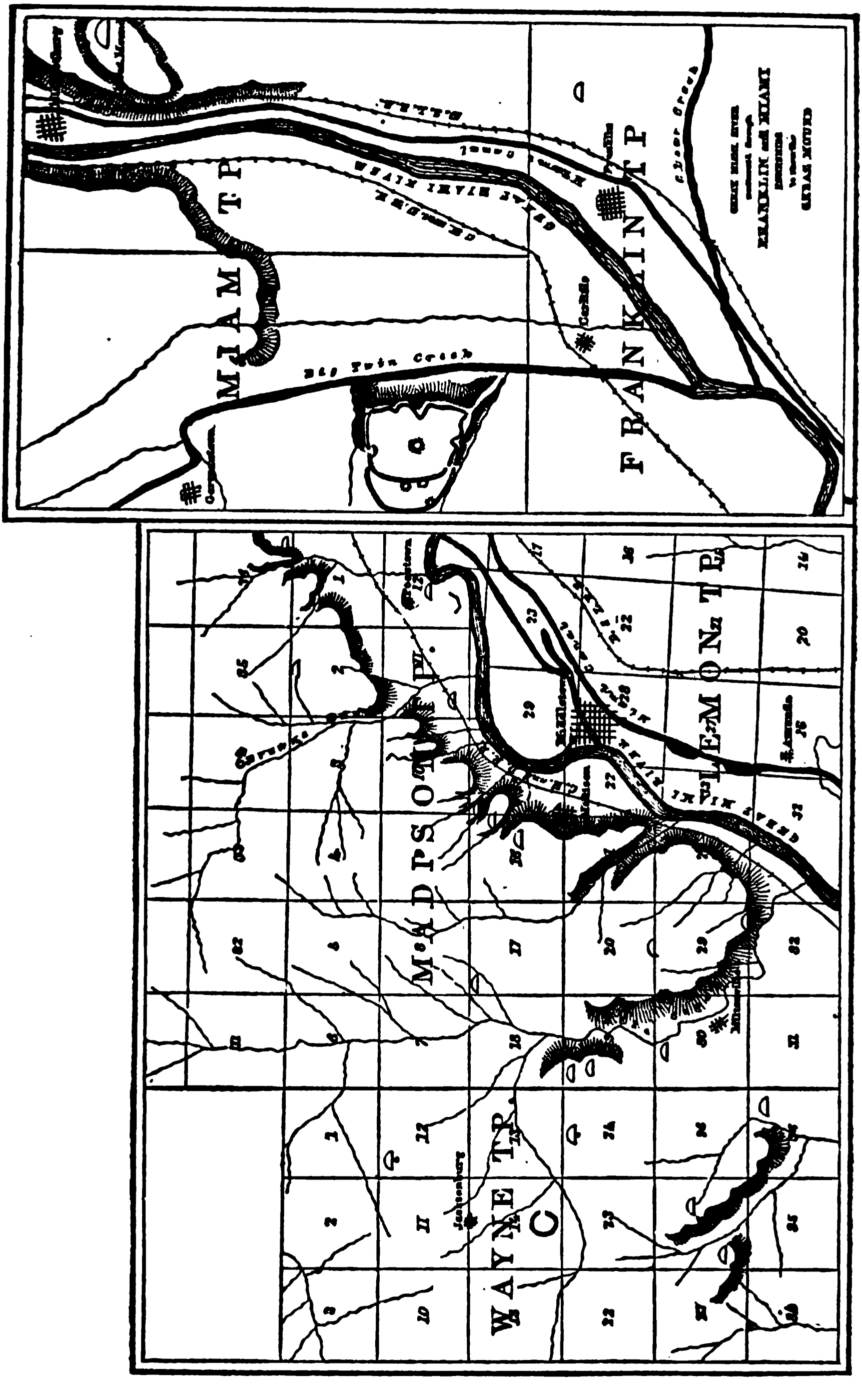
By J. P. MacLean, *of Hamilton, Ohio.*

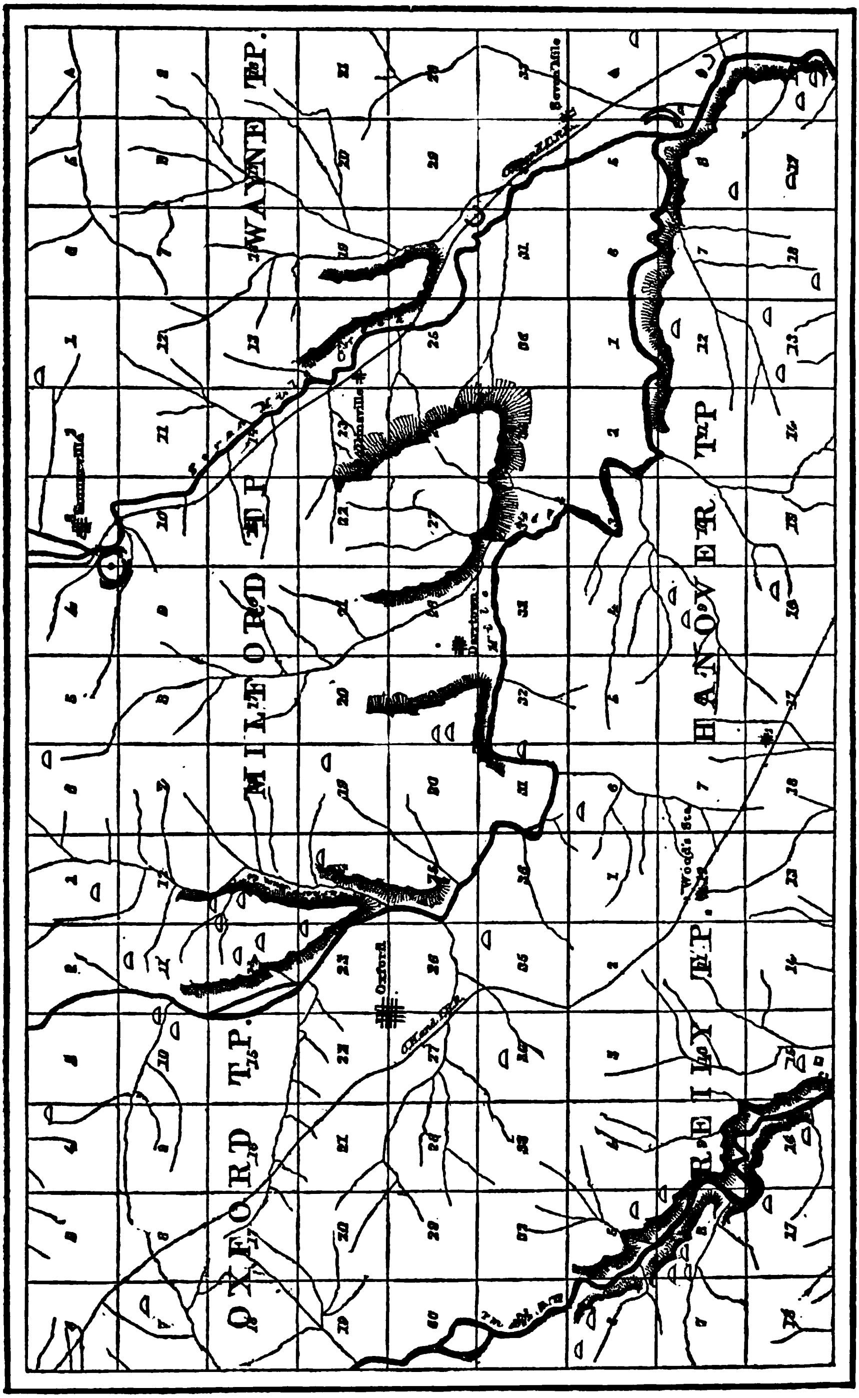
The great mound of the valley of the Great Miami River is situated on one of the highest hills in its immediate vicinity, and located about three-quarters of a mile southeast of the town of Miamisburgh, Montgomery County, Ohio, and about the same distance east of the Miami River. The hill is composed of limestone representing the geological formation known as the Hudson River epoch. Broken limestone crops out on the surface, and the soil is very thin, not adapted to agricultural purposes. The hill from the north and west is steep and may be said to be difficult of ascent. The surface of the country for a considerable distance to the east and south is very much broken. The mound is on the summit of the hill and on a natural knoll of a very noticeable declivity. The sides or various slopes of this knoll appear to be regular and of equal descent, or rather rising evenly from all directions. On the east side of the mound and penetrating it is an excavation walled with stone and probably used as a milk house. Two or three rods farther removed is a farm-house, while the same distance to the northeast is a barn. The mound is 68 feet in perpendicular height, and 852 in circumference at its base, and contains 311,353 cubic feet. The summit is level, circular in form, with a diameter of about 20 feet. It is said that from this point a view may be seen extending for 20 miles up the valley and the same distance down the river. The day I visited it was cloudy and rainy, causing the view to be limited, although one of the grandest sights within the State presented itself to my eyes. Some of the hills of Butler County, upon which I knew were located mounds, were before me.

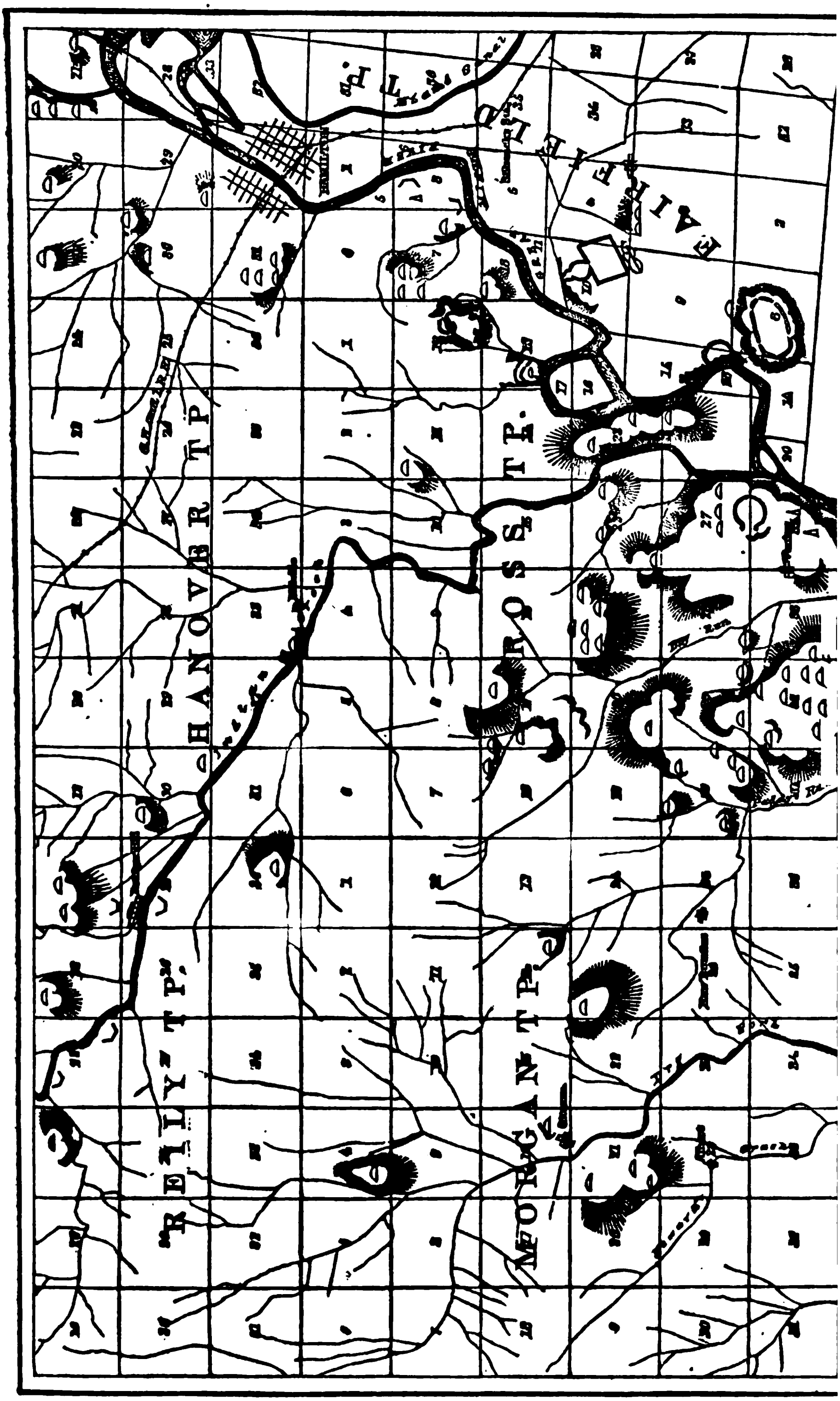
The summit of the mound overlooks some of the most important inclosures of the valley. Looking north a distance of 3 miles are the incomplete works at Alexandersville, figured and described in "Ancient Monuments of the Mississippi Valley," p. 82.

In a southwest direction and 5 miles distant from the mound is the Fort on Big Twin located on Sec. 3, German Township, Montgomery County, described in my work on "The Mound-builders," p. 25. An enlarged plan of the work is given.

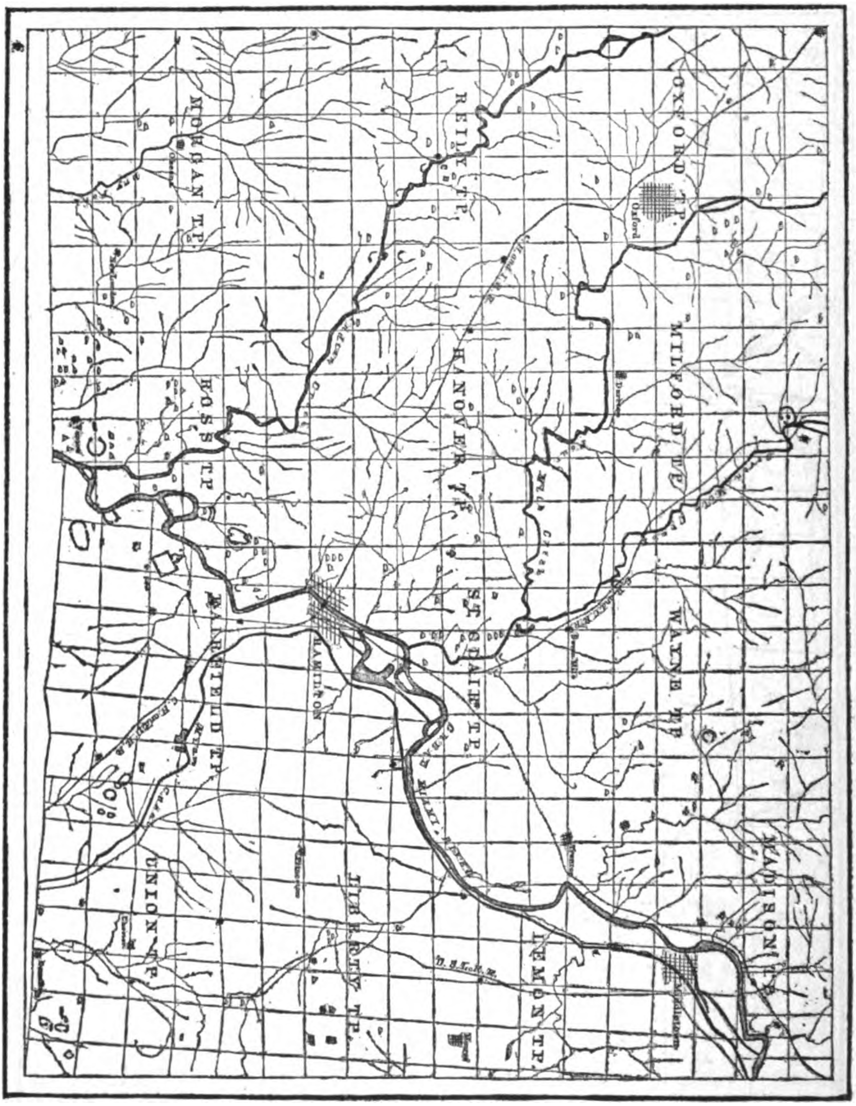
Nine miles northeast of the last-named fort, and 1½ miles south by west of Farmersville, situated on Big Twin Creek, is another inclosure containing two irregular circles, with still another at the north gateway. The work is situated on a spur of land about 100 feet above the creek with a perpendicular declivity. Toward the north the hill slopes and the


MIAMI TP
FRANKLIN TP
Big Twin Creek
Great Miami River
Clear Creek
FRANKLIN and MIAMI
MADISON TP
LEMON TP
WAYNE TP


OXFORD TP.
MILFORD TP.
WAYNE TP.
HANOVER TP.
REILY TP.
Oxford
Seven Mile
Woods Sta.


FAIRFIELD TP.
HANOVER TP.
ROSS TP.
REILY TP.
MORGAN TP.

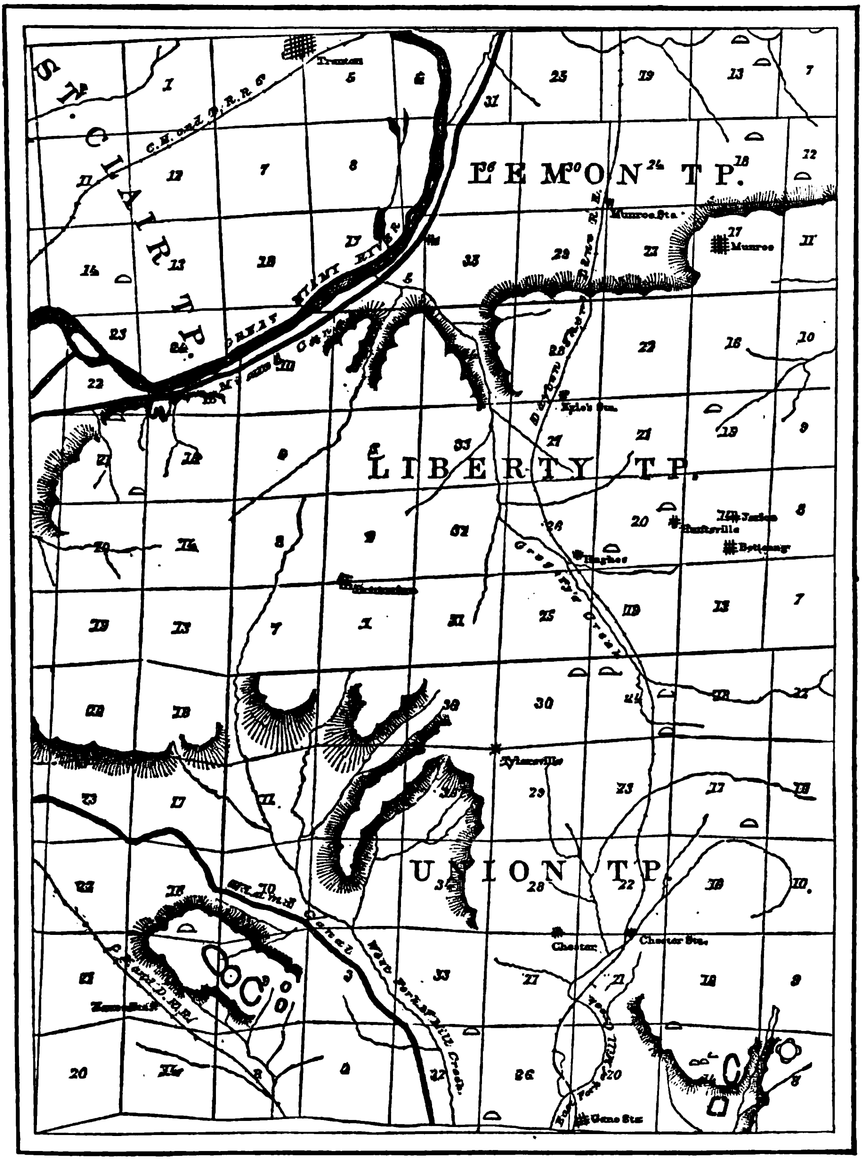
line of embankment is carried down the slope. The entrance-ways are at the east and west sides, the inclosure at these points being covered by a double line of embankment more formidable than at other points. The circles have no gateways. A short distance east by south are the



remains of what purports to have been a very large mound. The altitude of the mound as it now stands is 20 feet. The creek encroached upon the bank and gradually undermined the mound, taking away not less than three-fourths of it. The creek then receded to its present bed, distant about 20 rods.

On the same creek, in Lanier Township, Preble County, was once the work described and figured in "Ancient Monuments."*

Five miles south of the great mound is the large mound near Franklin, in Warren County. This mound is about 35 feet high, located on one of the high hills bordering the east bank of the river, and removed a distance of about three-fourths of a mile from it.



The best view of the Miamisburgh mound seen from any of the Butler County mounds, is that given from the summit of the mound on Sec. 32,

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* *Ancient Monuments of the Mississippi Valley*, p. 33 (Plate XII, No. 2).

Madison Township. In the same township, Sec. 19, is the highest mound in the county, with an altitude of 43 feet. A fire on the Miamisburgh mound would be distinctly seen from the summit of this mound. While this mound is not situated on the highest hill in the county, yet its situation is seen to be better adapted for the purpose of a signal station than any other spot, when the various earthworks it was intended to protect are taken into consideration. All the signal mounds radiate from this one. It is located on a hill rising 400 feet above the Miami. It overlooks the inclosure on Sec. 14, Wayne Township. A fire on its summit could be seen from the mounds on Sec. 26, Wayne Township; Secs. 9 and 16, Saint Clair, and Sec. 22, Fairfield; also from the inclosure situated on Sec. 16, Fairfield. The three mounds on Sec. 9, Saint Clair, overlook the inclosure last named, also the one on Secs. 4, 5, 8, 9, Saint Clair; the one on Sec. 30, Wayne, and that near Somerville (Secs. 3, 4, 9, 10), Milford. A light on the same three mounds (Sec. 9, Saint Clair) could be seen from the mound on Sec. 31, Milford, which overlooks the inclosure on Sec. 36, Oxford Township.

The mound on Sec. 20, Liberty Township, could be signaled from the Madison, Saint Clair, or Fairfield mounds. From that point communication could be had with the mound on Sec. 24, Union Township, thence to the mound on Sec. 14. The last named overlooks the inclosures on Secs. 14 and 8, Union.

Communication is established between the mounds on Secs. 16 and 19, Saint Clair, and from the latter to Sec. 12, Ross, located within a few rods of Fortified Hill Fort. This fort commands a view of the earthworks on Secs. 16, 10, 15, and 8, Fairfield, as well as Sec. 13, Ross.

A light on the mound in Sec. 12, Ross, would be seen from the mound in Sec. 21, and this by those in Sec. 30, Hanover, and 24, Reily, while one in the last named mound would be visible from that on Sec. 22, which overlooks the works just above the village of Reily.

The mound on Sec. 21, Ross, overlooks the mound and fort on Sec. 8, Fairfield, also the Cobrain works in Hamilton County, and the circular works on Secs. 27 and 34, Ross.

On Sec. 9, Union Township, and Sec. 15, Fairfield, were a series of works overlooked by a mound on last-named section. A communication could be had with this mound from several mounds on the west bank of the river, notably such as the mounds on Sec. 12, Ross, and 3 and 16, Saint Clair.

REMAINS ON BLENNERHASSETT'S ISLAND, OHIO RIVER.

By J. P. MacLean, *of Hamilton, Ohio.*[*]

The most famous of all the islands of the Ohio River is known as Blennerhassett's Island. For more than two generations it has been an historic spot. Around it clusters one of the saddest episodes in the history of our country. The traveler anxiously seeks to have it pointed out, and having once beheld it his imagination lingers at the spot. The history of the past wells up before him, and with pity and kindness he thinks of the unfortunate man who was once its possessor.

The island received its name from Harman Blennerhassett, who, in 1798, purchased the upper portion, containing 170 acres. Previous to this purchase it was known as Backus' Island. It is supposed that the island was first located by General Washington, in the year 1770. It was first surveyed in 1784, and in 1786 Patrick Henry, then governor of Virginia, made out a patent for it to Alexander Nelson. In 1792 it was purchased of James Heron by Elijah Backus. At the present time it is divided into four farms, and owned by four different parties, none of whom resides there.

All that remains of Blennerhassett's costly mansion and tasteful improvements are the old well, whose wall is covered with moss and fern, two sand stone steps, and a piece of a stone gate-post. Where once was the cellar is now a depression, with a sycamore tree several feet in diameter growing in the center.

The island is situated 14 miles below Marietta, and 1½ miles west of the mouth of the Little Kanawha. It extends east and west and is of peculiar form, narrow at the middle and broad at both extremities. It is over 3 miles long, although its area embraces only 297 acres. At the eastern extremity a ridge of land commences and runs through the center of the island until half the distance is reached. On either side of this ridge is a natural trough, resembling the bed of an ancient canal, with the ridge banks higher than those bordering the river. The trough or ancient channel bed on the north side of the western half of the island has been cut away by the river, thus leaving the ridge to form the river's bank. During high water the river breaks over its banks and flows through these troughs, and in its course deposits rich sediment. During the time of these explorations the river was high and had broken into the trough on the south side and flowed through the channel to the point where the water re-entered the river, thus forming an island of considerable size on the south. During low water the river recedes, thus reuniting the different parts of the island. The head of the island is covered with trees, which serve to protect it from erosion and also from damage by ice. Between these points is a dense covering of trees and underbrush left for the same purpose, on account of the land being low and the channel somewhat deep. Here driftwood accumulates in great quantities, making it of particular advantage to the islanders. Wisdom, however, would dictate to allow the driftwood to accumulate in order to protect this, the weakest part of the island.

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[*] The writer would here express his indebtedness to Mr. F. P. Ames, of Belpre, Ohio, for the valuable assistance he rendered in the exploration of Blennerhassett's Island. It was he who called attention to its antiquities, and who took every opportunity to make the visit both profitable and pleasant. Mr. Bryant E. Johnson also deserves grateful mention. Besides furnishing relics and granting permission to dig in the principal shell heap, he generously abandoned his plow and assisted in making the excavations. The illustrations were made from photographs and negatives furnished by Mr. L. C. Overpeck, of Hamilton, Ohio, who kindly volunteered to do the work without any charge.

The geological formation of the bluff on the Virginia side of the river was not examined, but the rocks appear to be the same as those on the opposite bank. On the Ohio side the rocks are composed of sand and take the name of sand-rock. Not far distant, and farther up the river, are located several grindstone quarries. The series of rocks belong to that age known as the upper portion of the coal measures. Through this sand-rock the Ohio has gradually cut its way until its bed is nearly 600 feet below the summit of the adjacent hills. That the bed of the river was once still lower is evident from the fact that its bottom is composed of sand and gravel. The river channel was partially filled during the glacial epoch, and since the close of that period the river has been gradually reaching its former level. During this process it has changed its bed several times. The plain of Belpre was its bed at the close of the glacial epoch. Distinct markings occur which exhibit changes that took place upon the plain. By the continued process of erosion, first on the Ohio and then on the Virginia side, shifting its channel from time to time, the river has cut its way to its present bed, leaving on the Ohio side a series of beautiful plains and on the Virginia a perpendicular bluff.

Blennerhassett's Island is not wholly an accretion of sediment formed by the river, but largely a deposit of the age of ice. The river, in the constant shifting of its bed, formed two channels at this point, which gives shape to the island. The troughs running along the sides of the ridge, thus forming three ridges (one of which is high and the other two low and bordering the river), were once additional channels, thus presenting four beds, all of which were occupied at one and the same time. When this was the condition of the river the island, in all probability, was a series of three islands running parallel, the two outer extending farther into the present river channels. The bed of the trough on the north side is higher than that on the south, and hence was the first to become dry. More than one-half of the old trough on the south side is still quite low and is soon overflowed during a rise in the river. The whole island is occasionally inundated, which generally inures to its benefit on account of the rich sediment usually deposited.

From the observations made the land seemed to be making on the south side, but on the western half of the north side the erosion was great. The river, flowing from the north, strikes the Virginia bluffs a little below the mouth of the Little Kanawha, and, on its rebound, passes over to the north side of the island and washes the Ohio shore, which in turn forces the waters against the island. So great has been the erosion at this point that the summit of the ridge is scarcely 3 feet in width. Unless it is soon protected the river, at no distant day, will cut through, which will result in the rapid annihilation of the western half of the island.

The geological structure presents a mixture of sand, gravel, clay, and river sediment. Fine sand is the principal ingredient; the clay and gravel are not predominant. The ridge is covered with a rich vegetable mold, varying in thickness from 4 inches to 30. Fossils are occasionally picked up, among them *Spirifer mucronatus* and a variety of *Zaphrentis*. Coal is washed upon the sand-bars in the form of rolled pebbles. The coal has been lost from sunken barges and then rolled along the bottom of the river. When thus found it takes all the variety of shapes represented in the river gravel or cobble-stone.

The fact that the island was rich in its archæological remains was known only to a few. The islanders are not interested in these remains save to pick up the relics, for which they find a ready sale. Curiosity-seekers have paid high prices for relics, simply as mementoes of the famous place. Two speculators have steadily watched the island for several years, and immediately after high water they search along the north bank where they pick up quantities of ancient art. These are disposed of without revealing their true locality. Although the writer visited the islands two days after a speculator had been there, enough relics were secured to illustrate fairly the wonderful productiveness of the place. Including those purchased, the following is a list of relics obtained: Fifty-seven arrow-heads, twelve spear-heads, one drill, four hatchets, one flesher or bark-peeler, two pestles, three hematites, two bodkins, one bone needle, two bone beads, seven ornaments, five circular stones, besides numerous pieces of pottery, human and animal bones, and three pipes, one piece of the bowl of a pipe, and two pipe-stems. Some of these are now deposited in the Smithsonian Institution. Occasionally complete vessels are obtained. Some of these were found by Blennerhassett, all of which were presented to his guests as soon as they were obtained.

The first point examined was the largest shell heap on the island near the center. The deposit is 1,125 feet long by 200 in width at the west end and 3 feet in width at the eastern extremity. What was the original width of the shell heap would now be impossible to tell. Mr. Bryant Johnson, who has resided on the island during the last twenty years, and in its vicinity all his life stated that, in his recollection the width had been reduced 70 feet, and the whole distance was covered with shells. Save along the margin of the bank the shell heap has been plowed over for the last forty years or more. The plow has displaced innumerable shells from their bed and thrown them upon the surface. The ground is almost covered with the shells of the *Unio*. Intermingled with these shells are numerous pieces of pottery, chert chips, the bones of the deer, &c. The jaw-bone of the deer is found in great numbers. The remains of two human skeletons had been recently turned out by the plow, but in a fragmentary state. This location is a little below the brow of the ridge. Lying on the beach human and animal bones occur with the shells of the land tortoise.

The point presenting the most satisfactory view for examination was the brow of the bank, for along this line the deposit of shells had not been disturbed by the plow. The bank presented first, a layer of vegetable mold varying in thickness from 6 inches to 30. Then a layer of shells (*Unio*) ranging from 4 to 6 inches, containing pieces of pottery, bone and stone implements, and the bones of various animals. Under this, at different points, varying in depth from 12 inches to 25 were ash pits. Then came a sandy formation lying over a stratum composed of sand, gravel, and clay.

Along this bank were made seven excavations; the first was at the eastern extremity. As the ridge here is so extremely narrow the face of the bank was slightly cut away in order to discover whether the shells occurred farther east along the neck. The shells here presented a fair compactness of deposit, but on being handled their sharp edges crumbled. This is also true of the other places examined. Farther westward, immediately under the mold, and 4 inches below the surface were found in conjunction, intermingled with the shells, several pieces of pottery and an implement made of the antler of a deer. It had been ground to a point and was probably highly polished. It does not come to a point evenly, but presents two flat sides. Numerous split bones occurred and the jaw, axis, and other bones belonging to the deer (*Cariacus virginianus*); a little west of the middle, 2 feet below the surface was found a human skull, and with it a shell bead of the *Oliva*. It was lying on its left side, with its base toward the north and within the bank a distance of 4 inches. Under it and partly around it was an ash heap. All the bones of the face were in place when discovered, but rapidly crumbled on exposure to the air. By great care the cranium was saved almost entire. It is now in the Smithsonian Institution. The entire skull was filled with vegetable mold, very compact, and full of rootlets, some of which still adhere to the sutures. On the removal of the mold, within the skull and lying against the sagittal suture were a pebble, a piece of charcoal, two finger bones, three sections of the vertebral column, a piece of the atlas, a part of the sphenoid bone, and pieces of the ribs, also one of the teeth (bicuspid of the upper jaw) in the right orbit. It may be a matter of interest to know how these bones came to be displaced. The skull bore no traces of having been rolled or even displaced since inhumation, save a twist in the lower jaw. If the skull had been displaced then the body or rest of the skeleton was displaced with it. The probability is that some small animal burrowing into the earth found the body before decomposition had destroyed all the fleshy parts, and entering the skull through the *foramen magnum* used the cranium for a home. This must have taken place prior to the accumulation of vegetable mold within the cranium. But this will not account satisfactorily for the gravel stone and charcoal within the cranium nor the tooth within the orbital cavity. The following are the measurements of the cranium:

	Inches.
Longitudinal diameter	6
Parietal diameter	5½
Vertical diameter	5
Intermastoid arch	12
Horizontal circumference	18¾

The cranium nowhere bears any traces of artificial flattening. On placing it side by side with a skull taken from a mound in Liberty Township, Butler County, Ohio, a great difference presents itself in every feature. Compared with an Indian skull from the west bank of the Great Miami, same county, still another difference is seen besides its noticeable smallness. The only feature in common is the raised line along the sagittal suture. But between it and a skull from a mound near Belpre, Ohio (noticed farther along), a great similarity is readily seen in every characteristic feature. The skull was found where it had been placed by the burial party. Had it not been for the few bones protruding from the bank it would have been missed. The remainder of the skeleton had been washed away by the encroachments of the river. The fire-heap had gone out and was partly buried before the interment, and vegetable mold had commenced to form over it. In covering up the body some of this mold was thrown immediately over it. The probability also is, that some shells had been deposited prior to the inhumation. The mold above the skull gave no evidence of having been disturbed.

Within 3 inches of the skull, and on the same level with it, an atlas of the deer was found; on the west of the skull, and removed about 2 feet, yet on the same level, were excavated a chert chip and one of the bones of the foot of the deer; immediately below the skull, and lying on the beach, were pieces of the lower and upper jaw of the deer; also the scapula and one of the bones of the foot of the same animal, besides many fragments of pottery. This pottery, like all the rest found, was made of clay mixed with crushed river shells.

The next examination was made a little farther west. The vegetable mold was over a foot in thickness, and the remains of the shells and works of art also a foot in depth, including ornamented pottery and fragmentary bones in abundance, together with a human atlas. A broken implement was obtained here. It is composed of porphyry, and was finely polished. It presents four sides, showing breakage. In all probability it was originally a bark-peeler.

At the last point examined the shell deposit is from 6 to 10 inches below the surface. Under the shells is a charcoal layer. In this deposit were found ornamented pottery, an implement from antler, the lower jaws of the deer, both young and old, the split bones of same animals, the breast bone of some large fowl, probably the turkey, and other objects of interest.

It is evident that if one should excavate at any given point within this shell-heap works of art would be revealed.

It should be remarked that the above excavations did not partake of the true character which that word necessarily implies. Only a few inches along the face of the bank were removed, a further exposure being unnecessary. Another consideration also had weight, that to cut much away would endanger the bank, and hence would have been disadvantageous to the land.

It is along this bank where most of the implements which have been thrown upon the market have been taken. All the implements mentioned in the paper either came from this shell-heap or else from one on the southeastern part of the island.

Other shell-heaps inspected are small and composed of the *unio*. They were not explored, as they appeared to belong to the same age as the one fully described above. The shell-heap at the southeastern part of the island covers about one-half acre, extending to the south bank of the ridge. When first discovered it was inclosed by a low wall, nearly square, composed of surface material. Pipes, ornaments, circular stones, and, some other implements were found in this heap.

A little below the shell-heap, and over the brow of the bank, five human skeletons were dug up. Two of these were very large. They were placed in a straight line, heads near together, but divided by a small pile of shells.

These heaps face the Virginia shore, with the exception of one. It is probable that the large one faced both shores originally. The general surface of the land presents no reason why the heaps should be so located. It is not probable that the Virginia side contained more of the unio, and even if it did the supply would not have held out long enough to have continually maintained a residence on the south. The reason must be looked for in another direction. The Virginia bluffs do not present a favorable point of attack by marauding bands, and, hence, it may be concluded that the south side was deemed safer in case of an assault by an enemy.

Fifteen different forms of arrow-heads are common on the island. They are composed of gray, black, and brown chert, chalcedony, jasper, and hornstone. As the implements occur in abundance it is probable they were fastened to arrows and used for shooting fish. Implements of the form commonly called a drill, composed of jasper, were probably used in fishing. The general opinion that these so-called drills were used for perforating stone or other implements may be true. So far as my own observation extends this view is not sustained. Hundreds of them have been examined by the writer, and many are in his cabinet, yet out of all these not a half dozen would indicate that they had been used for drills. If so used their edges would be more or less broken. In Butler County, Ohio, they are almost wholly found along our larger streams. It is probable that sometimes they were used for drilling, but usually in fishing or in the chase.

The forms of spear-heads made from chert and other stone are various. One with a sagittate base is composed of a very pure and clear chalcedony. Only the stem or base is left; the shaft lost. This form is rare in the latitude of Ohio.

Other forms of implements were secured; a drilled ornament composed of the columella of the *Pyrula perversa;* another composed of the same, not perforated, resembling a handle, but with no appearance of ever having been so used; the tips of the horn of the deer, already referred to; pendants composed of cannel-coal, in one the eyelet is broken, but in the other it is perfect; beads made from bones of the bird; a bone awl; one cup-shaped form is called an "eagle-stone." It is a natural formation, and must have been picked up from the gravel. It is partly drilled, and perhaps intended for a suspended ornament.

Three forms of pipes occur in the collection. One is composed of baked clay, and is as hard as stone. It somewhat resembles catlinite. Near it was found the stem, composed of the same material. As this stem makes a complete fit in the orifice or stem end of the pipe there can be no question that it was intended for this identical pipe. The workmen did not complete it, for the perforation is still unfinised. At one end its depth is one inch, and at the other one-fourth inch. A second pipe is composed of a fine-grained sandstone, blackened by use and age. At the top and opposite from the stem is a lip made for adornment. The third is an incomplete pipe, composed of calcite, and intended to represent the head, neck, and breast of some bird. A tube composed of steatite found with it was, in all probability, a pipe-stem.

Among the pottery fragments are ears; one is perfect and the other broken. One stone celt might be classed between hatchet and bark-peeler. It is somewhat rude, never was finished, and is composed of greenstone. A polished hatchet composed of greenstone and a tool of the same material, probably used as a polisher, are types of stone implements.

Circular discs occur. Some of them are perforated; one is discoidal, and all of them are composed of fine micaceous sandstone, excepting one, of cannel-coal. Its face is smooth, and near the center is a countersink. The perforation is regular, but not smooth. The opposite side is roundish, with a slight depression at the center. It is scratched by the coarse grains of sand.

Another implement is composed of a very hard quality of baked clay, and probably used in polishing. Chert flakes are everywhere picked up in the two principal shell-heaps. Nodules of red hematite are common here, but do not belong to the island.

Some of the coarser implements found are a broken flesher or bark-peeler, polished and made from sandstone, a pestle, made of quartz and finely polished, another unpolished and composed of a compact sandstone, a double mortar, composed of sand-rock. The obverse bowl is 6 inches long, 5 wide, and 1½ in depth. The reverse bowl is of the same depth and 5½ inches in diameter at the top.

Double mortars are seldom met with in the Ohio region. The collection contains also a so-called spindle-rest, with three perfect circular depressions. On the opposite side is one similar depression. The material is a fine sandstone. It was found in Highland County, Ohio. The mortar is from the alluvial deposit on the Ohio side of the river, immediately opposite Blennerhassett's Island.

The implements above described do not represent all that are found on the island, but only those obtained. Some very fine hatchets, composed of brown hematite, and grooved stone axes were seen, but they could not be purchased. Doubtless other classes of implements are picked up from time to time.

After a careful study of what was observed at Blennerhassett's Island the following conclusions were reached:

(1.) The shell-heaps were all deposited by the same race of people and at the same period of time.

(2.) The deposits were formed by that race commonly known as the American Indians.

(3.) The evidence appears to lead to the conclusion that the Indians who formed these heaps belonged to the earlier tribes; for (*a*) time must be allowed for the formation of the vegetable mold, and (*b*) also a period must elapse for the growth of the forest trees. When the island was first known to the Caucasian it was covered with forest trees, which extended over the shell-heaps.

(4.) The island was a permanent home for the savages, and chosen on account of its natural advantages. The savage races of North America chose their abodes, whenever practicable, along the margin of streams, partially because it afforded them protection against a sudden attack. The high bank near the point of the confluence of two streams was always chosen either for villages or camping parties, for the reason that only one side needed to be guarded. Blennerhassett's Island was protected on all sides, thus giving natural advantages not afforded on the main land. The deer and other animals were hunted on both sides of the river and brought over in their canoes.

(5.) The evidence that the island formed a permanent habitation is further shown by the vast amount of chert chips scattered throughout the heaps. The chert was brought from "Flint Ridge," in Licking and

Muskingum Counties, Ohio, and then worked into such forms as the "arrow-maker" had designed. The cannel-coal was brought from a distance, and then shaped into such forms as was desired. Two good-sized pieces of cannel-coal were exhibited, which had been plowed up.

(6.) That this people either bartered or undertook long excursions is shown by the chert and cannel-coal implements, and the ornaments made from the columella of the *Pyrula*, which shell-fish lived in the Gulf of Mexico.

(7.) The numerous skeletons turned up by the plow probably belong to a later age. It is hardly susceptible of proof that the people who deposited the shells would bury their dead in shallow graves before their huts. That intrusive burials occurred on the island as late as the time of the white man is proven by the evidence of a lead pipe found among the shells. The stem of this pipe is 3 inches long, and the bowl 1¼ inches in height. It shows the traces of the molds.

On the Ohio side of the river, and immediately opposite Blennerhassett's Island, and on the second river terrace (plain of Belpre), are numerous evidences of the mound-builders, consisting chiefly of mounds. One of these mounds is a miniature representation of the truncated mound in the cemetery at Marietta. Like the above, it is surrounded by a wall, with the ditch on the interior, the elevated pathway leading from the mound to the gateway. In front of the gateway (parallel still kept up) is a straight embankment several feet in length. The only difference in the design of the two mounds is that the gateway in the Belpre mound faces the north.

About one year ago a mound near the above was removed. It measured 14 feet in height. In it were found several human skeletons and numerous tubes and pipes. It is composed of some kind of mottled stone resembling steatite. One of the steatite tubes measures 11 inches in length, and it is 1 inch in diameter across the mouth. The bore is perfectly smooth and even until it reaches within one-eighth of an inch of the opposite end, where it suddenly contracts and the remaining part of the aperture becomes quite small. This end of the tube (some call it a pipe) is surrounded by a flange 1½ inches in diameter. The tube is finely wrought, and exhibits much skill on the part of the workman.

Near the top of this tumulus was found a human skull, which is now in the Smithsonian Institution. In form it is similar to the one obtained on the island. The wormian bones in the right lambdoidal suture and at the junction between the lambdoidal and sagittal sutures are the largest the author has observed. These bones do not occur in the skull from the island. The following are the measurements:

	Inches.
Longitudinal diameter	6½
Parietal diameter	5½
Vertical diameter	5¼
Inter-mastoid arch	13½
Horizontal circumference	19¼

Over the left orbital cavity, and just above the superciliary arch, is a perforation one-half inch in diameter. Another perforation occurs in the right parietal bone, near the sagittal suture.

On the farm of Cyrus Ames, and on the alluvial terrace, several years ago, the river washed out a hollow structure, composed of stone carefully laid up in the form of a well or cistern. This subterranean vault had no visible outlet. Near it was found a rude mortar.

It is probable that other remains occur on the plain of Belpre and on the Virginia side, but as attention was not called to any other ancient works, this account must here come to a close.

ABORIGINAL STRUCTURES IN CARROLL COUNTY, TENNESSEE.

By JAMES M. NULL, *of McKenzie, Tenn.*

The aboriginal structures in this county are four mounds, situated in the southwest corner of civil district No. 22, three of them on Clear Creek, and one on Crooked Creek, 4 miles south of McKenzie, Tenn. Crooked Creek and Clear Creek are small, ever-running streams, with swampy bottoms and miry banks, without any fords except where they are crossed by the old Indian trails. Mound No. 1 is 8 feet high and 30 feet in diameter, being situated in a front yard. The owner will not allow it to be explored. It is on a ridge running down to a point on the creek, half way between a spring 300 feet distant on the west and a bluff 20 feet high on the east. On it were standing, when first occupied 35 years ago, a chestnut and a sweet gum tree, each 2½ or 3 feet in diameter.

Mound No. 2 is on the south bank of Clear Creek, three-fourths of a mile from mound No. 1, in a northwest direction, 350 feet from a bluff 15 feet high, and 200 feet from a spring. It was originally not more than 3 feet high and 30 feet in diameter, was in a horse lot twenty-five years or more, and has been plowed over for 10 years, so as to be nearly obliterated. During the plowing nothing in the way of relics has been discovered.

Mound No. 3, one-half mile northeast of No. 2, is on the east side of a bluff 20 feet high, and 200 feet distant, and about the same distance from a spring. It was 6 feet high and 25 feet in diameter when explored a few years ago. A man dug a cellar in it, knowing it to be an "Indian mound," hoping to find valuables. He sunk a pit 12 by 14 feet, 2 feet below the original surface, and found nothing but "red dirt," as he expressed it.

Mound No. 4, 6 feet high and 20 feet in diameter, is one-half a mile northeast of No. 3, and 1½ miles north of No. 1, with a spring 300 feet and a bluff 600 feet distant on the east. It is situated in the woods, but has no growth on it. There is no depression of the earth near by. It was explored by an old gentleman 30 years ago for treasures. He sunk a pit 3 feet in diameter from the center of the summit to the level of the surrounding earth. A gentleman who was present gives the following account: The mound was composed of red clay, and extending from the apex to the bottom was a circular space, 6 inches in diameter, consisting of black mold, apparently the remains of a pole, around which the mound had been built; nothing else was discovered.

At the head of the bluff, east of mound No. 1, is a good ford, with hard, sandy bottom, the only one known on Crooked Creek. On the north bank, which is 10 feet high, is a deep worn trail, plainly visible, although it has not been used as a crossing since the settlement of this country, as long ago as 1820. The old settlers call it the "buffalo trail." A ridge runs from this ford to the lower end of the bluff near mound No. 2, where there is another ford and the only one on Clear Creek for a number of miles. Like No. 1, it shows a deep trail worn down the bluff on the east side. From the bottom runs a ridge near mounds No. 3 and 4.

When this country was first explored by white men, all the land west and north of Clear Creek for a great distance was open barrens, almost devoid of timber, and, consequently, a vast grazing place for buffalo, elk, deer, etc. These fords gave them the only means of crossing in their migrations, and the absence of any remains or relics in the two explored mounds leads me to the opinion that they were designed for observation. Each one is within sight of another, from No. 1 to No. 4. Mr. Edward Gwin, who settled this place, collected quite a number of relics in the vicinity of mounds Nos. 1 and 2, consisting mostly of spear and arrow heads and obsidian axes. They were sent to the Smithsonian Institution by Prof. E. H. Randle a few years ago.

The other indications of the former occupation of this region by the aborigines are the remains of a great number of workshops. There are a great many springs in this country, and wherever a spring occurs, on the nearest elevation will be found quantities of flint chippings, broken pottery, incomplete arrow-points, blocks of flint, smooth, rounded stones, some with a small cavity worn on one or on both sides. These places occupy an area of from ½ to 2 acres. The material used must have been brought from a great distance, as there is no stone in this country except soft sandstone, and very little of that.

In 1863 the author assisted in exploring a mound 3 miles west of Tupelo, Miss. It was 8 feet high, 30 feet in diameter, and composed of white sand. It was situated on a ridge 400 feet west of a bluff, at the base of which is a spring. A shaft about 6 feet in diameter was sunk from the summit to the level of the surrounding soil, and a circular space filled with dark mold was reached. It was not more than 2 inches in diameter. The ridge on which it was situated was composed of loose sand covered with small growth of scrub oak.

MOUNDS IN PUTNAM COUNTY, GEORGIA.

By BENJ. W. KENT, *of Eatonton, Putnam Co., Ga.*

The most remarkable mounds in Putnam County were visited and measured by Charles C. Jones, jr., and the writer, and reported by Mr. Jones, namely, the Eagle Mounds, of which no description is needed in this communication. Since the last report the stone tumuli on the plantation of Dr. J. T. de Jorrette, east of Eatonton, have been disturbed, and besides human bones taken therefrom, a pottery pipe of the ordinary size, and shaped like the head of an eagle, was found. No description is necessary of the other pipes in the series excepting the one made to imitate a human foot, which is remarkable for the hardness of the stone. From the stone tumulus on the plantation of Robert M. Grimes was taken a soapstone finger-ring, not in the writer's collection, which is without ornamentation. Another finger-ring, found near the Eagle Mound, on Scott's plantation, is made like a seal ring, with a head or top. None of the pottery collected is remarkable; one vessel is about 14 inches high, and a bowl measures 13 inches across the top; all the remaining vessels are about the usual shapes.

There is in this place a chungkee stone of white quartz or limestone about 6 inches in diameter, owned by Thomas B. Harwell. It is beautifully smooth, hollowed out on either side, and more smoothly finished than any other implements ever seen by the writer except those of Mexico or Peru. It has no hole through the center like the one drawn in Foster's Prehistoric Races (p. 218).

The human bones picked up from time to time reveal nothing unusual. It is impossible, however, to get any whole skulls. Attention is drawn to the fact of the existence of human remains under every conical-shaped stone tumulus so far as examined; but whether such will prove true of the bird-shaped mound is not known, as the stones are too large to be removed Regarding the three mounds on Shoulder Bone Creek, near Sparta County, pipes and pottery have been obtained from the largest mound, but no human bones; whereas from the middle mound, which is the smallest, and but little above the level of the bottom lands, having been plowed over for 7 years, many human bones and teeth and beads were taken. Ashes and shells are often found, showing where the aborigines lived. There existed hereabouts, so far as I know, no cave dwellings, and neither masonry nor sculptured slabs. While an isolated skeleton is sometimes found, many exist in the tumuli. No skeleton in a cyst or other receptacle has been found, except one of an infant, probably in Mellepueli. All the stone tumuli are on high hills, usually on the highest portion; all the earth tumuli are in the bottom lands.

There are various other mounds and shell-heaps in this and adjacent counties. There is an earth mound on the lands of Mr. C. Purifoy, in Jasper County, once probably 6 feet high, but now much leveled by plowing. Near Murder Creek, in this county, and not over half a mile from the Clinton road, exists a stone tumulus said to be of immense size, but never visited by the author. Near Little River, and below Pierson's mill, and on the opposite side, are several stone tumuli, and another group east of these. They are within a few feet of the conical group, and not more than 100 yards apart. There is a mound near Dr. Jorrette's dwelling, near the opposite bank of the Oconee River, from which was dug a bird-shaped calumet, and human bones also were found. There is a rock mound on the plantation of Robert M. Grimes, near the line of Hancock and Greene counties, also an earth mound about 8 feet high and 30 feet in diameter, west of the rock tumulus, and near the Oconee River, in Greene County, situated in the bottom land. Near Lawrence's Ferry, and between Little's Ferry road and Oconee River, is a mound supposed to be bird-shaped, inclosed in a circle. Upon the plantation of Dr. White, Hancock County, are mounds of earth, near which runs a ditch.* Various other small mounds and shell-heaps are scattered over this county.

PREHISTORIC REMAINS IN FLORIDA.

By J. FRANCIS LE BARON, *U. S. Engineer.*

I arrived in Fernandina, Fla., February 26, 1877, accompanied by an assistant. This place seemed to have been a camping or living place of prehistoric man, for there was to be seen here the remains of a somewhat extended kjökkenmödding, on the north side of the town.

I next went to Jacksonville, and remained there until July 14. While there I made the acquaintance of the principal archæologists of the place, and from them obtained many valuable notes and suggestions.

Mr. A. A. Knight, esq., informed me of the location of the mound in T. 2 S., R. 27 E., and the shell-heaps or kjökkenmöddings at the mouth of the Saint John's River, in T. 1 S., R. 29 E., which I have since visited. Those on the north side of the river on Fort George Island are mentioned by S. P. Mayberry in the Smithsonian Annual Report for 1877, p. 305, and by a writer in Harper's Monthly for November, 1878, in an article entitled the "Sea Islands."

W. W. Dewhurst, C. E., postmaster at Saint Augustine, referred me to the mounds in T. 3 S., R. 26 E., and T. 4 S., R. 26 E., two miles east of Mandarin.

Leaving Jacksonville on the 14th of July, 1877, we sailed up the river in a two-masted sail-boat and discovered our first mound one mile south of Picolata, on the east bank, in a high hammock. It is of sand, about 25 feet in diameter at the base, and 8 feet high, and situated about 50 feet from the river. We did not open it, and it showed no signs of ever having been explored. Leaving this place and continuing up the river, we passed a mound on the east bank, 5 miles south of Tocoi, without knowing it. The next mound that we found was situated on the west bank of the river, about 2 miles north of Pilatka. It was a shell-heap about 12 feet high, the eastern edge abraded by the waters of the river into a steep bluff. A large part of this shell-heap had been carried away in boats to form walks and drive-ways in Pilatka and for fertilizing purposes.

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* *Antiquities of Southern Tribes*, C. C. Jones, jr., p. 144.

This practice is very common throughout the State, and is working the speedy destruction of these interesting remains.

The shells in this mound were mostly fresh-water species. The bottom of the mound is washed by the river, and the part that has been exposed to the continued action of the water has formed a kind of calcareous conglomerate, which is thickly interspersed with human and other bones, broken in all cases that came under my notice. The conglomerate forms a very hard, apparently durable, stone, upon which extreme age would produce but little effect.

I am informed by Mr. James H. Fry, of Pilatka, that there is a mound in the swamp half a mile west of the shell-heap. Arriving at Pilatka I found the remains of a small mound, filled with broken pottery, in the southeast part of the town. The fire-bell tower stands upon it, and it is partially demolished. There seem to be kjökkenmödding remains all along the shore here. I was fortunate to meet Mr. J. H. Fry in this place, and I found him well versed in the archæology of the region, and disposed to give me all the information in his possession. To him I am indebted for the location of a large number of stations, including the following:

1. A shell mound nearly opposite Pilatka, a little to the north, on the land of Mr. Thew. There is a wind-mill on the top.

2. A large shell mound, about 9 miles east of Pilatka, on the land of Mr. Rollinson.

3. A large number of mounds, 20 to 30 miles west of Pilatka, from one of which shells and arrow-heads have been taken.

Mr. Fry had a large collection of relics from different mounds; among them was an earthen bowl holding about a quart, in perfect preservation, which was taken from a mound in Lake Worth, on the east coast. Mr. Fry also informed me that there was a well-defined chip-yard, or aboriginal neolithic workshop, with an abundance of rejected fragments of flint, on the east bank of the Saint John's where it leaves Lake Monroe.

At Pilatka I also met Col. H. L. Hart, to whom I am indebted for the locations of two mounds on Murphy's Island, in the Saint John's River, 10 miles south of Pilatka, on his land.

Leaving Pilatka, the next mound on the river, going south, is 4 miles south southeast up a creek. We stopped next at San Mateo, a landing on the east side.

From Mr. P. B. Bishop there I learned of a mound about 15 feet high, 30 feet in diameter, on the southeastern shore of Orange Lake, Marion County.

The next place of interest on our route was a shell bluff near Buffalo Bluff, on the east side of the river. Here we found human and other bones and pottery in abundance. The bluff was about 6 feet high, and the locality gave evidence of having been a residing station of an ancient people. This place is only a short distance south of the mouth of Dunn's Creek. A little further on we came to Mr. White's, on the same side of the river. From him I obtained the following data: There are three mounds here on Mr. White's land, and three shell-heaps partly on his land and partly on that of his neighbor, Mr. McDean. There is also a shell-heap on the opposite or west side of the river, about a quarter of a mile from the bank, claimed by Mr. White to be the largest in the State; and a shell-heap and mound three-quarters of a mile south of Mr. White's, on the east bank, on land known as the Hernandez grant. There are, besides these, one on the west bank, 2 miles south of Mr. White's, which is very large; one opposite this, on the east bank; a very large one on the east bank, 4 miles south of Mr. White's; a very large one on the east bank, 6 miles south, on land of Mr. Wells; another very large one on the east bank, 13 miles south of Mr. White's, at a place now called Beecher, at the entrance of Little Lake George; and, finally, one on the east shore and one on the west shore, 2 miles south of Beecher.

On the east side of Dunn's Creek is a mound with earthworks and fosse. There is another mound on the same side of the creek, at its junction with the Saint John's, on land of Mr. Wells, or very near his line; and one on the other side of the creek, on Mr. John Wells's land.

On Bear Island, in Dunn's Lake, there are mounds, and others on both sides of the lake. Mr. Wells's house, at Nashua, Putnam County, east bank of the Saint John's, is situated upon a large shell heap. There is another about half a mile north of Mr. Wells's, on the same side; and still another west of Mr. Wells's, about a quarter of a mile from the river, on the first island in the swamp. There is also a shell-heap on the west side of the Saint John's, half a mile north of the mouth of the Ocklawaha River and half a mile from the Saint John's River. We passed the celebrated Mount Royal, but did not go ashore to examine it, as it has been so fully described by Bartram and Professor Wyman. There was a large shell heap (kjökkenmödding) at Fort Gates, on the opposite side of the river from Mount Royal and a little to the south. Here Dr. Lente found an arched fire-place or oven, with numerous bones of turtle, deer, and other animals, together with human bones, on land belonging to himself, about 30 feet from the wharf. The arch, he stated, was perfect, and was found several feet below the surface of the kjökkenmödding as it was being leveled. He informed me that it exhibited the true principle of the arch.

Five miles south of Fort Gates we came to the outlet of Lake George. Here on the east side, on land of Martin Hyas, are two mounds and two shell heaps, in Range 26, Township 13, East and South. These were pointed out to me by Judge Bartlett, of Georgetown, whom I found very kind and obliging, and who left his office and took me through the hummock to the locality. On Lake George are additional remains, as follows:

1. On the west shore, commencing at the northern end, there is a shell mound directly west of Hog Island.
2. One on Salt Run, 1 mile up the run.
3. One at the mouth of Silver Run.
4. A very large shell-bluff on land of Damon Greenleaf, at the mouth of Silver Spring. The shell mounds noticed near Silver Lake, and one 2 miles up Juniper Creek, are given on the authority of Professor Jeffries Wyman.*

Passing around the southern extremity of the lake to the east shore, at the influx of the Saint John's, at a place called Lake View, we find a very large mound on land of Mr. Rapes.

Next on the Acosta grant, Range 27 S., Township 13 E., on Dr. Lente's place, called Seville, there are several small mounds.

We now leave Lake George, and passing up the river to Volusia find there a large cone-shaped mound at the landing on the east side of the river. This mound appears to be nearly 20 feet high, and at least 300 feet in diameter at the base. There is a house and orange grove upon it. It is irregular in shape, and was probably built on hilly ground. Professor Wyman speaks of a shell deposit there and a mound at Fort Butler, opposite, but we saw nothing of them. The next shell mounds observed by us are those called Orange Bluff and Bartram's mound, near the outlet of Lake Dexter. These are also mentioned by Professor Wyman.† He also speaks of two between these and the last mentioned, which we did not see.

The next shell mound visited is at Saint Joseph's, 7 miles north of Osceola, on the west bank of the river. There is a house on it. We did not stop again until we arrived at Blue Springs. There are several shell-heaps shown on the map in this distance which had been examined by Professor Wyman, so we did not stop for them, but contented ourselves with a view of them as we sailed along. The one on the west bank at the outlet of Lake Beresford appeared very large. The other one is half a mile south of Palm Landing, and one a mile south, both on the east side. At Blue Springs I was fortunate in meeting Mr. L. P. Thursby, to whom I am indebted for valuable information, as was Professor Wyman on his visit. We found there the shell heaps mentioned by the latter on both sides of the Blue Spring outlet.

The next shell mound is at Mr. Scott's, called Barker's Landing, on the east bank, about 2 miles north of the mouth of the Wekiwa. There is a house upon it. At the mouth of the Wekiwa there are two mounds on the east bank of the Saint John's. They are 1 mile south of Emanuel Landing. One is about 100 feet from the river, on the edge of the hummock, and the other is about 250 yards, and in the hummock. There is another about 7 miles by river, 4 in a straight line, near or on land of Colonel Thrasher, about a quarter of a mile from the Saint John's River, across a marsh. This mound is 1 mile north of Lake Monroe, on the east side of the river.

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* *Fresh-water shell mounds of the Saint John's River, Florida*, p. 38.

† *Ibid.*, pp. 35, 37.

Professor Wyman mentions extensive shell deposits, 6 or 7 miles up the Wekiwa, but we did not visit them. There is a shell mound on the Sanford grant, at the north end of Lake Monroe. About Lake Monroe are other mounds, as follows:

The celebrated shell mound at Old Enterprise; this was being carted off when I visited the spot, August 15, 1877, for the purpose of fertilizing a neighboring orange grove. I collected several specimens there, of which mention will be made further on. The mound was apparently about half gone. It was composed of fresh-water shells, similar to those now found in the lake, but very much larger than any now living that I have seen.

There were occasional fragments of large sea conchs, many human and other bones, and much pottery with ashes, &c. Very many of the delicate shells were uninjured, although very fragile, showing that they must have been piled up in very large quantities at a time, and not have been simply the remains of a feast left on the ground, for in this case the shells would have been exposed to breakage by the trampling of feet and movements of the family. Throughout the mound the shells were deposited very loosely. There was not sand enough to bind them together, and remarkably little humus or black soil. This heap cannot then be classed as a kjökkenmödding. It must have been raised for a purpose, and not as the incidental accumulations of kitchen refuse. If the shell fish were used as food it would seem that they must have been boiled whole and then the shells thrown on the pile after the extraction of the tenant.

I am informed by Mr. Scott, of Barker's Landing, that 2 or 3 miles from this mound and from the lake is a shell heap, composed entirely of oyster shells.

Leaving Lake Monroe, the first station of interest was Ginn's Grove. Here are two sand burial-mounds and near by is a shell heap, or rather a kitchen refuse heap (kjökkenmödding). One of the mounds is high and conical, the other low and flat, and spread out over a large extent of ground. The conical high mound had been opened previously and we found several fragments of pottery and human bones thrown out of the excavation.

Continuing on our voyage we passed Lake Jessup by a cut-off, and so did not see the mounds referred to by Professor Wyman, and shown on the map at outlet of Lake Jessup. Lemon Bluff was the next place where we found prehistoric remains. This about 10 miles from Lake Harney. The bluff is about 30 feet high and on the top is a cultivated field, and here are found indistinct remains, broken pottery and shells. It was evidently a place of residence.

At Cook's Ferry, on the west bank of the Saint John's, at the outlet of Lake Harney, is a very large shell heap, on which is an orange grove and house. I found several pieces of pottery there and some bones of animals and human beings. This is described under the name of King Philip's Town by Professor Wyman. Back about 200 yards is a small but steep conical sand mound. In this mound Mr. Coue, sheriff of Volusia County, found two flakes of silver about as large as a 25-cent piece; they were smooth and without marks, and he thought were poor silver.

On the west side of Lake Harney, just north of Fort Lane, is a mound. I am also informed that there is a large earth-mound at Fort Christmas, above Lake Harney and west side of Saint John's, in pine woods.

The next that we visited was the so-called Orange mound, about half a mile south of Salt Creek outlet, and on the west side of the Saint John's. This has the appearance of an island in the boundless marshes surrounding it, and is visible from a long distance. It was then covered with trees, which have since been cut away, sugar-cane and other crops being planted in their place. It is conical in shape, rising on all sides to the center. It is colossal in dimensions, being over 600 feet in diameter at the base, and about 40 feet high. The ground appears everywhere to be composed of black earth and shells and ashes. It does not seem possible that it should have been artificially formed, for the nearest dry land is as much as 3 or 4 miles off, and communication can only be made by boats. It appears to me probable that it was a retreat for the women and children in time of war, and that there was originally a small hill there, which was increased in size by the accumulations of shell-fish and kitchen refuse, incident to a prolonged camp. A small excavation made by some alligator hunters, which I examined, yielded the usual pottery and broken bones. I think this place deserves a careful exploration.

There is a small mound of like nature about 2 miles south of Lake Harney, on the west side of the Saint John's River, and about a quarter of a mile off in the wet prairie. It is covered with cabbage palms, and is but 3 or 4 feet high.

The next mound, as I have been informed, is situated at the northeast end of Lake Poinsett, on the east bank. Going further south, there is an earth mound at Fort Taylor, on the west side of Lake Winder, on the margin of the lake. There is now a country store on it. There is a mound 10 or 15 miles south of Lake Washington, at the head of Big Cypress Swamp, west side of river, and north of the swamp. For the last three I am indebted to Mr. Osteen, tax collector of Volusia County.

Professor Wyman mentions two shell heaps on the east bank of the Saint John's and the right bank of Salt or Moccasin Creek (facing down stream), near the union of the creek with the river. One of these he calls Possum Bluff, but wrongly, as Possum Bluff is situated about 15 miles south of Orange mound, in a straight line on the east side of the Saint John's.

There is a mound near the mouth of Snake Creek, which connects Salt Lake and Lufman's Lake. It is about one-half to three-quarters of a mile up the creek. Mr. Coue informed me that he had made a cursory examination of it, and found a lot of beads and a human skull with a bullet-hole in the back.

This completes the locations on the Saint John's and its tributaries as far as my examinations extend. The Ocklawaha River, I am informed, contains a great many on its banks. Crystal River, on the Gulf coast, is mentioned by Col. F. L. Dancy, formerly State engineer and geologist of Florida, as having a remarkable mound on its bank, 4 miles from its mouth.*

Several mounds are reported 20 miles south of Saint Augustine, on Peltier's Creek, on land of David Carter, and shell-fields on Anastasia Island, opposite Saint Augustine.

I am also informed by a "Cow-boy," who had seen them, that there are two or three mounds on the east bank of Reedy Creek, in the northeast corner of Polk County, between the creek and Lake Tohopekaliga, and also remains of extensive earthworks, believed to be fortifications, near the bay on the east side.

I am informed there are mounds on two large islands in Lake Kissimee, southerly from the last.

Mr. A. W. Conklin mentions in Forest and Stream of December 30, 1875, pp. 330 and 331, the following mounds and earthworks:

One near the south bank of Boggy Creek, a stream which flows to the southeast and empties into the northwestern bend of Little Tohopekaliga, and another about 4 miles further south, near the edge of Fennel Prairie. These mounds, he says, are very much alike, being about 50 feet in diameter and not over 10 feet high. Also a greater number on Barton's or Parton's Island than in any other place. One in particular, which he calls Parton's mound, seems to be a fortification, with a fosse, enciente, graded approaches, &c.

A mile to the northwest of the above-described works, in the edge of the hummock overlooking Pleasant Lake, are the remains of a very large fortification, with walks nearly 20 feet in thickness and from 3 to 8 feet high.

Other and somewhat indefinite remains are found on a hill, about a mile to the southwest, across Pleasant Lake. One mile further west, on Pine Island, he says, there is another work, consisting of a mound surrounded with a wall, and having what he thinks an artificial boat

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**Smithsonian Report*, 1866, p. 357.

harbor. In the interior of the island, which is 2 or 3 miles in diameter, other mounds are found which do not differ materially from the one at Boggy Creek. In addition to these larger remains, the main island has on its surface some two or three hundred smaller mounds, usually about 30 feet in diameter, and 2 or 3 feet in height. He considers these dwelling places.

Four miles south of Pine Island is a work similar to the one at Pleasant Lake. Along the eastern side of Lake Tohopekaliga are a number of small mounds, and at the place of Charles McQuaid, on Lake Cypress, are two of the ordinary round-topped mounds. Twenty miles southeast of Lake Kissimee is another large mound. It is about 35 feet high, 40 yards in diameter, built of sand, with a graded approach, and covert way. About a dozen miles southeast of this mound, which is called the Hope mound, in the neighborhood of old Fort Drum, are two other mounds similar to it.

All down the Kissimee River mounds are to be found, of which the largest and most important is at Daughtery's, on the west side of the river, 4 miles northwest of Fort Bassenger, on Istokpoga Island, at the northeastern extremity. Here we have again the graded approach, a covert way, and circular bastion. One hundred yards to the west is an earthwork resembling a redoubt. Eighteen miles to the southwest of this mound, in the marsh which bounds the island, is a part of a wall, which is a mile in length. At the southeastern extremity of Little Tohopekaliga Lake is a work similar to the Parton mound already described.

Along the Kissimee River are embankments apparently raised by the hand of man, running for long distances in a straight line. He says they were apparently constructed for dikes. In the Parton mound, on the Little Tohopekaliga Lake, John Evans, ex-sheriff of Queen's County, exhumed fifty-four skulls which had been buried close together, forming a circle.

At McQuaid's, mound on Lake Cypress, a piece of gold, inscribed with characters in some unknown tongue, was found. It was hammered, not coined, and sold for $16.

The "Hope mound," near old Fort Drum, has not been disturbed, and offers with others near it a fine field for the antiquarian. The articles taken from the Daughtery mound are all modern, consisting of an immense variety of beads, some small as a pin's head and others an inch in length, of various colors, and some of them gilded—glass ear-drops, and a piece of silver about 3 inches in diameter and about equal in thickness to a silver half dollar; two steel axes, each over 10 inches in length, one 4½ and the other 5½ inches on the blade. On the sides of the ax are several markings made with a cold chisel. All these articles were found near the surface.

Mention is also made of a remarkable work on the Caloosahatchee River, which appears to be a canal. On the west side of Lake Okeechobee, near Fort Center, just above the mouth of the Trathlopopkahatchee River, in Townships 40 and 41, Range 31 south and east, are mounds, as I am informed by Dr. Kenworthy, of Jacksonville, and others who have visited them. There are fortifications south of them in T. 42 S., R. 30 E. Dr. Kenworthy also locates a mound south of the Caloosahatchee River in T. 45 S., R. 26 E. Mention is made of shell banks at the mouth of Manatee River, Tampa Bay, in Smithsonian Report for 1866, page 357. Mr. James M. Kreamer, chief engineer of the Atlantic and Gulf Coast Canal and Okeechobee Drainage Company, who has lately visited the remarkable canal on the north side of the Caloosahatchee River, discribes it as a canal 4 feet deep by 10 feet wide, clearly cut through the low flat pine woods, and the excavated sand and earth thrown up on the sides. It starts from the upper end of Lake Flirt, and runs in a northeasterly direction, in a perfectly straight line, as if laid out by an engineer, to a group of large mounds situated in the pine woods about 3 miles from the Caloosahatchee River, and then returns to the river in a southeasterly direction between Coffee Mill Island and Lake Hiakpochee, inclosing a triangular area, and having a total length of nearly 6 miles. Large pine trees were growing in the bottom, in places where there was no water. Many of these trees were as large as any growing in the surrounding forest.

Returning to my own discoveries, while chief engineer of the Saint John's and Indian River Railroad in Florida, and engaged in locating the line from Titusville to Lake Harney, I found the following mounds: About half a mile from Titusville, and a quarter of a mile north of the track, on the south side of the wagon-road to Salt Lake, is a small sand mound in the pine woods. It is only about 5 feet high, and perhaps 15 feet in diameter at the base, and is overgrown with bushes and saw palmetto. Four miles and fifty-four hundredths from the terminus in Titusville, at the junction of the Salt Lake branch of the railroad, is a large sand mound. The Saint John's and Indian River Railroad comes round near the west side. It is about 200 feet in diameter and 30 feet high, almost a perfect cone. The pits from which the sand was taken are plainly discernible at its base. This mound is mentioned by Professor Wyman,* who opened it on the top, and found a "skeleton and piece of coquina cut in the form of a turtle." Subsequent explorers found two silver coins in it, which were in the possession of S. J. Fox, then general manager of the Saint John & Indian River Railroad.

The next mound is about a mile from the railroad, to the east of station 160 (100 feet stations starting from "Indian Mound Station" on the Salt Lake Branch Railroad), or about 3 miles from the junction.

At station 284, about 5½ miles from the junction, is a small mound on Turtle Island at the head of the Salt Lake Prairie. It is situated on the immediate east bank of Boggy Branch, and only about 60 feet northeast from the center line of the railroad. It is a sand mound about 25 feet in diameter, and 5 or 6 feet high.

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* *Fresh Water Shell-Mounds of the Saint John's River, Florida*, p. 16.

Commencing now at Mosquito Inlet, on the east coast, and going south, I will mention the mounds on the Hillsboro' River, Mosquito Lagoon, Indian and Banana Rivers, and Lake Worth, as far as I have been able to discover and locate them or learn of them. But first I will mention a mound on the farm of Mr. Andrew Bostrom, on the Halifax River, north of the inlet and nearly opposite Ormond. This mound is just south of the house and close to the bank of the river. It was originally about 50 feet through at the base and 6 feet high, but has since been cut through on the western side to form a road.

There is also a high sand mound a few rods south of Smith's place, about a mile south of Bostrom's, on the same side of the river.

South of Mosquito Inlet the first mound is at "the extreme north end of Block Hummock, 3 miles west of Mosquito Inlet." This is described by A. M. Harrison, assistant United States Coast Survey,* who found in it human skulls and several peculiar beads.

We come next to the large shell heap at New Smyrna. This is a kjökkenmödding, about 20 or 25 feet high, 300 feet long by 150 wide. It contains broken pottery. There is a country store upon it. There is a shell mound opposite, not a kjökkenmödding, at Captain Briggs's, formerly Alden's place, which is mentioned by D. G. Brinton, M. D., in Smithsonian Report, 1866, p. 357. Half a mile south of New Smyrna, on the west side, is another large shell heap near the river, with a house upon it.

One mile and nearly three-quarters south of New Smyrna, on the same side, is a large shell heap upon which are the ruins of Turnbull's Castle, and just north of it Turnbull's Canal. The canal and castle were built by the English during their occupancy of this region.

South of the post-office in New Smyrna, at a distance of 5¾ miles, is a mound on the west side, near the river and Mr. R. Burdick's place, which is known as the Fox mound.

Six and a half miles south of New Smyrna and on the same side is a very large shell mound, with a house upon it. The place is known as Childs's, but is now owned by Mr. F. J. Lockwood. It is about 30 feet high and 400 feet long on the river. Directly opposite this, and half way to the ocean, in the middle of the large mangrove marsh, is a shell heap on a branch of Cedar Creek. It is about 15 feet high and 60 feet in diameter at the base, which has been partly washed away by the waters of the narrow creek. If this place was chosen for concealment, the builders were eminently successful, as it is very difficult of access and effectually hidden by the thick mangrove trees. It seems incredible that human beings would ever have chosen such a place for a habitation, unless to escape discovery from an enemy. The island upon which the mound stands is all mangrove marsh.

One mile south of Childs's, by the west passage, is a large mound on a small island near the west bank, known as "Brick-house Mound."

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* *Smithsonian Report*, 1877, p. 305.

The Coast Survey have a trigonometrical station and a stone post on top. This mound is high and steep, and composed of oyster shells and conchs. It is about 100 feet in diameter, and 20 or 25 feet high, with a steep bluff on the eastern side, where it fronts on a small cove. This cove contains the best oysters on the east coast. A wagon road has been built around the eastern face and a causeway across the marsh in the rear to the main land, about 100 yards, where there is a large wild orange grove which has been budded with sweet stock.

Nearly due east from this shell heap, on the ocean beach ridge, is the celebrated Turtle mound, 8½ miles south of New Smyrna. It is composed mostly of oyster shells, with occasional conchs. The western side, next to the Hillsboro' River, is now abraded by the water to a precipitous bluff. It appears to have two summits, with quite a valley between, and the sides are covered with thick bushes. This mound is described by the same writer in Smithsonian Report, 1866, p. 357, and by myself in Rod and Gun, November 4, 1876.

We come next to a very large mound at Bissett's Hill, on the west side of Hillsboro' River, about a mile south of Turtle mound. It is as much as forty feet high, with steep sides, composed of shells and black earth, and covered with a wild orange grove. It was also used by the Coast Survey as a triangulation station, and its position is well shown on their published chart, No. 4, of the Inside Passage, East Coast of Florida, Hillsboro' River. Several of the mounds on the Hillsboro' River and Mosquito Lagoon are shown on these charts.

Directly east of Bissett's Hill, on the beach ridge or peninsula, close to the East Channel, is a small shell-bank at a place called Pumpkin Point.

Just a mile and a half below Bissett's Hill is a small shell mound, called "Live Oak Mound," on land of Mr. Lafayette Allen, and a few rods north of his house. This I did not examine.

A little more than 2 miles south of Bissett's Hill, on the west side, is a shell heap known as Oak Hill. It is about 18 or 20 feet high, nearly 800 feet long and 500 feet wide, the longest side fronting on the lagoon. It is composed of shells, mostly oyster, and is very irregular on the top, with many small hillocks of shells, with depressions between them, as if the hill had been the abode of several families, each one making its own heap. The east side is washed by the waters of the lagoon, and the west is backed by a marsh and creek about 800 feet wide altogether. Human bones and pottery are found in it. There is a post-office called Oak Hill upon it and several houses. Mr. Rideout, formerly a county commissioner of Volusia County, once lived here, and two of his family are buried on the top, just south of his house. This is a true kjökkenmödding. It is situated on a point, partially protected in the rear by a creek and marsh, as is the one at Bissett's Hill. This kind of location was a favorite one with these people. It served to protect them from the stealthy approach of an enemy or from the dangerous attack of wild beasts and reptiles, of which the black bear and panther, and poisonous snakes were the most dangerous. It also gave them greater immunity from the mosquitoes, and enabled them to enjoy the cooling sea breezes in summer. For the same reasons the first settlers have generally chosen these places for their own residence.

A little less than half a mile southerly, on the lagoon shore, same side, is another large kjökkenmödding, and there is a house upon this also, belonging to Mr. Frank Sam's, of New Smyrna. This heap is nearly as large as the one at Oak Hill.

Continuing south just a mile, by the west shore of the Mosquito Lagoon, we come to Swift's wharf, built several years ago for the purpose of shipping live-oak lumber. On the shore, at the north side of this wharf, is a large mound and shell heap. Captain Swift's headquarters and office is located upon it. This place is in sec. 9, T. 19 S., R. 35 E., and the two previously described are situated in Sec. 5, same township and range.

Continuing south now, we come to the "Ross Hummock," on same side of lagoon and near Mr. McCarty. Here we find a large sand burial mound, about 50 yards from the west bank of the lagoon, in what was a wild orange grove, but had been grafted and cleared up at the time of my visit in February, 1878. There is a small brook between it and the shore, close to the mound and a deep artificial ditch with running water about 100 feet to the south. This last is believed to be the work of Dr. Turnbull's colonists at the time of the English possession of Florida. The mound, as I have stated, is of sand, with very precipitous sides. This has apparently never been opened.

Two and a half miles north of the Haulover Canal, near Butler Campbell's, there is said to be a burial mound in the scrub, about 200 or 300 yards from the west shore of the lagoon.

Passing through the aforesaid canal and going south about half a mile we come to a small sand burial mound on land of Charles H. Nauman, formerly Lisbon Futch. It is about 155 yards from the east bank of the Indian River. I made a partial examination of this mound in 1869, and described it in Rod and Gun, November 4, 1876. We found there only portions of skeletons and broken pottery. Subsequent explorers have opened a trench through the mound down to the original surface of the ground. They found nothing worthy of note except a large oval coquina stone, about 2½ feet in transverse and 14 inches in conjugate diameter. Around the shortest medial circumference a groove was cut about 2 inches deep, as if for the fastening of a rope. There were no other marks upon it, but it had evidently been rounded and brought to shape by the hand of man. This stone was left lying at the base of the mound by the discoverers, where I saw it in 1878. I am informed by Mr. Nauman, whose house is only about 200 feet east of the mound, that the stone was found in the exact center of the mound at the bottom. It is difficult to determine its use. It could have been used as an anchor for a large canoe or for fastening a guy-rope.

We pass next to the shell-banks, or kjökkenmöddings, at Dummett's, 1½ miles from the last. These are low fields, with shells and pottery, and are found on the lagoon and Indian River sides of the isthmus. One of the largest orange groves in the State is growing at each of those places. They were originally wild groves.

Passing then to the head of Indian River, on the east side of which we find a mound in the hummock near Mr. Griffis's, and descending to Titusville I learn that there was a small sand mound about 6 or 7 feet high on land of P. E. Wager, who removed it and excavated a cellar for a house on its site. It was about 300 feet from the west bank of Indian River.

East southeast from Titusville, on the east side of Indian River, on Merritt's Island, there is a large mound on land of Dr. Moore, as I was informed by J. W. Joyner, since deceased, who also stated that he picked up several earthen vessels on it, which he used in the house until broken by the children.

On the Banana River there is a large shell-bank containing broken pottery, at the De Soto Grove, on the east side of the river, on the line between Townships 22 and 23 South. South of this about 5 miles is a burial mound in the orange grove of M. O. Burnham, keeper of the Cape Canaveral light-house. It is about 8 feet high and 50 feet diameter. There was a wild orange grove there.

South of Titusville, 12.3 miles by the new Titusville and City Point road, as I located it, is a large sand mound in the hummock now belonging to Charles R. Carlin, but formerly to Albert Faber. It is on the west side of the river, about 500 feet from the bank, in T. 23 S., R. 35 E. It is about 25 feet high.

A very large mound or shell heap is reported directly east of the head of Banana River, near the ocean beach, but I have never visited it.

In T. 24 S., R. 36 E., are two sand mounds on Merrit's Island. The most northern one is about half a mile west of New Found Harbor, and the other is only about 100 feet from the east bank of Indian River, in Section 27, near the house of Aaron Cleveland, C. E. They are both small.

The next mounds of which I have any knowledge are situated on the peninsula, between Indian River and the Atlantic Ocean, at the mouth of Banana River. There is at that point a very large shell mound, which was used by the Coast Survey for a triangulation station. Its western face is abraded by the waters of the river into a steep bluff, the river having encroached nearly to the center. It is composed of small shells and ashes, mixed with human, animal, and fish bones. It is not far from 50 feet high and 300 or 400 feet in diameter on the river.* The back of it is covered with a wild orange grove, and it is covered with large India-rubber, torch-wood, and other trees. There is broken pottery mixed through it, but I could find but one stone implement, although the broken river face presented a fine opportunity for viewing the interior. I am informed that near this to the north are two burial sand mounds in the scrub, although I was able, after a close and long-continued search with two assistants, to find but one, and this had been opened. What appears indistinctly like a wide level road or way leads due east from the shell heap, between two ponds, which possibly were once one.

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* Detailed survey and plan of this locality was made.

Less than a mile south of this mound is a small kjökkenmödding on the immediate east bank of the river, on land of J. M. Hopkins, whose house and garden are situated on it. There are somewhat indistinct remains at the mouth of Crane Creek, at Melbourne, on the north side, on land of Thomas Fish, deceased, and on the south side on land of Peter Wright. On the opposite side of the river in Sec. 6, T. 28 S., R. 37 E, is an Indian mound. South of this not quite 2 miles is another, both on the east side of the river, and the last opposite the mouth of Turtle or Turkey Creek. I am told that shell fields exist on the banks of this creek but have not examined them.

Cape Malabar is an insignificant point of land on the west bank of Indian River. South of the cape, on the same side, about four-fifths of a mile, is a shell mound on land of E. Arnold, and adjoining this, to the south, is a shell bank. About a mile and a half south of the Arnold mound there is a sand mound, on land of Mr. Damon, in Sec. 8, T. 29 S., R. 38 E.

The next mound is of shell, situated on the beach ridge due east from the island called Grant's farm, and near the northeast corner to T. 30 S., R. 38 E. It is called "Wild Boar Mound," and is situated in a deep bay of the river at a very narrow place in the peninsula. The waters of the river come to the foot of this mound, which is about 20 feet high and 200 feet long on the river, with steep sides, and composed of broken pottery, shells, and ashes.

In T. 31 S., R. 39 E. is a high long bluff of shells on the west side of Indian River. I have not examined this except from the river, but it is probably an extended kjökkenmödding.

Opposite Jupiter Inlet on the west bank at Stone's Point are several large oyster-shell heaps, as I am informed by numerous observers, one of which is said to be *very* large. In the southern end of Lake Worth, in T. 45 S., I am told there is a large mound on the west side of the lake, about 100 yards from the beach, and across the lake on the sea beach there are two large shell heaps composed of oyster shells. No oysters exist now within 10 miles of these heaps. There is also a mound in the hummock opposite the old inlet to the lake.

On the Delesfine grant, on the east boundary of Sec. 32, in T. 22 S., R. 35 E., is a very small and insignificant kjökkenmödding. It is very probable that this place is of much more recent age than the remains previously described herein, it having the appearance of a camping place of some of the Seminole tribe of Indians.

I will now briefly speak of some prehistoric remains in the southwestern part of the State that I have lately visited.

In March, 1881, I started from Orlando, Orange County, Florida, with an ox-wagon, in charge of a Government party, to make certain surveys and examinations for a steamboat route from Saint John's River to Charlotte Harbor, on the Gulf of Mexico.

We passed down by Forts Gatlin, Davenport, and Clinch, and thence down the valley of the Big Chocleypopka River to Peace Creek; thence to Charlotte Harbor, and from there to the mouth of Caloosahatahee River and up the river nearly to Lake Okeechobee. Before making Fort Clinch, and near Lake Pierce, we passed near the Indian village of Chipco, named after the old Seminole chief, since deceased. We visited the village, which consisted of less than a dozen cabins built of logs and fan palmetto. It is situated on a small hill. Numerous sweet orange trees in bearing were growing among the houses, and a sugar-cane field was being cultivated near by. The Indians had been living on this spot for many years, but there was no indications of a kjökkenmödding forming. This is accounted for by the fact that these Indians live principally on venison and fish. No shell-fish of any kind were observed about the place, and so the principal agent in the building of the heaps was wanting. This may account in some measure for the absence of heaps in the country traversed from Orlando to Charlotte Harbor, as no shell-fish are attainable in that region.

In all this distance from Orlando to Charlotte Harbor, about 120 miles, I found only one prehistoric mound that I could confidently assert to be of human origin. This was a small kjökkenmödding on the west bank of "Stake Ford" prairie, just north of the entrance of the south prong of the Big Chocleypopka River. It was situated in a grove of live oaks and was small and uninteresting.

On the west bank of Lake Livingston, about 12 miles north of the last-named locality, we found about one-fourth of a mile from the lake what appeared to be an earthwork, about 5 feet high, and perhaps 800 feet long, shaped like a crescent broken in the middle. It was in flat pine woods, the convex side facing the lake, and the interior was at that time a grass pond with three small islets, the water about a foot deep. It is very doubtful whether it is the work of man, but it struck us as singular to find such an embankment in the flat pine woods, whose monotonous level is often unbroken for many miles.

At the town of Myers, on the site of Fort Myers, I found a small sand mound in the western part of the town. Second street is laid out over it.

Captain Peter Nelson, of Myers, told me that a canal existed clear through Pine Island in Charlotte Harbor. This is a long, narrow island about 1½ to 2 miles wide. He said public opinion was divided as to the builders, some attributing it to the mound builders and some to the Spaniards, or early pirates. I was unfortunately unable to visit it. There is quite a large mound below Myers on the same side of the river, about a mile from the town.

In the summer of 1880 I was appointed county surveyor of Brevard County, Florida, and surveyed the south line of the county, starting in near the mouth of the Saint Lucie River, and going west about 22 miles. On the way to the starting-point, at the mouth of the Saint Lucie River I stopped at Fort Capron, opposite Indian River outlet. Here I found a large deposit of oyster-shells resembling a kjökkenmödding, but saw no mound. I stopped also at Fort Pierce, about 4 miles south of Fort Capron, and here I found a large sand mound on the west bank of the Indian River or Saint Lucie Sound, and just south of the old fort, the embankments of which are plainly discernible. I stopped also and examined Mount Elithabeth, which is shown on nearly all maps of Florida. I found this to be a large, high, and symmetrical mound of black earth and shells, which would probably be classed as a kjökkenmödding. It is an immense work, probably 60 feet high, and with the exception perhaps of Turtle mound, the largest prehistoric monument that I have seen in the State.

I found also, on the north bank of the Saint Lucie River, about 3 miles from the mouth, in a large bay of the river, another immense mound called Mount Pisgah, truly gigantic, and of the same character as Mount Elithabeth. Near its base is the remains of a stone house, built of coquina stone, and believed to be the remains of the abode of some of the pirates that are known to have infested this locality in the early days of the present century. I saw no other mounds on the whole trip.

This completes my present knowledge of the prehistoric remains of Florida. As the object of this paper has been to simply state facts, I will not enter into any lengthy discussion as to the objects or uses of the shell mounds.

Different persons with whom I have conversed in Florida have suggested that some were built for lookouts, others as sites for residences, to enable the dwellers on them to obtain the benefit of the breeze, so desirable in this climate, while others have thought they were used as dwelling-places to avoid the mosquitos, which are so troublesome in the woods near the ground, and others still that they were used as dwelling-places, to enable the occupants to escape the floods which even now in certain seasons often surround their bases during great storms. This last hypothesis receives more credence from the fact that numerous instances have occurred of white settlers resorting to them in such emergencies. It may perhaps be safe to say that incidentally they have served all these purposes. Not a few persons whom I have met contend strongly against this artificial origin, believing them to have been cast up by the sea, but they totally fail to account for the presence of broken pottery and bones which almost invariably forms part of their composition. The great shell banks on Fort George Island, at the mouth of the Saint John's River, have the appearance of oyster banks in which the shell-fish were killed by some geological catastrophe, such as elevation above the water, but the remains of man appear distinct, superimposed upon them. This place deserves more careful study. I have endeavored to fix the location of all the mounds and remains in the State of which I could learn, in the hope that others with more leisure at their disposal and better fitted by anatomical knowledge might be aided in their search by these descriptions. If in this I have succeeded, I shall feel that my labor has not been in vain. There are numerous mounds and shell heaps on the western coast of the State that I have been unable to visit. Many of them will be found described in the recent Reports of the Smithsonian Institution. In regard to the race or tribe who have left these monuments, it appears to me most probable the kjökkenmöddings were the work of successive races or generations of Indians. and incidentally formed by the slow process of accumulation naturally coincident to prolonged residence on one particular spot, and the bulky and imperishable nature of the remains of the shell-fish upon which they principally subsisted, this residence being chosen and maintained as most eligible, and in many places the only dry location available throughout the year. These kjökkenmöddings are now generally the most desirable places of residence to be found in the adjoining country, and they and the immediate vicinity are commonly occupied by the present settlers. The reason for the formation of the shell heaps is more obscure. Some intelligent persons, however, with whom I have conversed are of the opinion that they both have been modified by the action of water since their formation, the stratified appearance of some of them and their immense extent lending a shadow of plausibility to this supposition. If this should be the case it would define an age for these remains far earlier than has generally been supposed. The general absence of stone or flint implements would seem at first sight to favor this hypothesis and carry the age of these remains back to the earliest advent of man in the Palæolithic age. I think, however, from my somewhat extended observations in this and other States that the theory of a submergence since the original formation of the shell heaps cannot be maintained.

We find the same appearance of stratification in the small shell heaps in Ipswich, Mass., examined and mapped by me in 1873 for the Peabody Museum, which are of comparatively modern date, and it is easy to see that this stratification could have been formed in the gradual accumulation of the heaps, occupied probably, at irregular intervals, by the wandering tribes. It is known that the Ipswich shell heaps have never been covered by flood. In all the remains that I examined in Florida I could find no evidence of a superimposed stratum of material foreign to the heap, except such as resulted from an accumulation of vegetable humus, or was caused by the action of the wind transporting loose sand, and by the action of the river waters at their several stages or such higher stages as periodically occur. I have, then, unhesitatingly assumed the remains to belong to the Neolithic age, and account, in a great measure, for the absence of flint and stone implements by the almost entire absence of material from which to construct them in the regions examined. The natives undoubtedly possessed some of these things, but they must have been brought from a great distance, and were therefore held in great esteem and corresponding care taken of them. Their tools and weapons were probably mostly of wood, and have, of course, long ago decayed. Very many of the flints found were probably the implements of the later Indian tribes.

Regarding the remains in the Kissimmee Valley and about Lake Okeechobee there is little doubt that they were constructed by a race anterior to the Seminoles, and for purposes of worship or war; possibly, also, in some places for internal improvements. These remains deserve careful and systematic search and study. I am informed by Dr. Kenworthy, of Jacksonville, that he has found on the Gulf coast other evidences of attempts at improvements by canals on a large scale.

The amount of pottery that is found in Florida is truly astonishing. In the kjökkenmöddings it forms a large percentage of the material. It is found also in the sand mounds, generally in larger pieces, and sometimes in whole vessels. It has never been my fortune, however, to find any of the latter. There is scarcely a hummock or piece of rich arable land which does not yield numerous specimens upon being cleared and dug up. It seems as if the ancient people who used it had an eye to fertility in choosing their residences, and goes to prove that they practiced agriculture. They certainly made a very judicious selection of lands for cultivation, if we are to believe that these places had been in actual cultivation where such broken pottery is found in the soil. It is very seldom that it is found scattered in like manner in the poor, light, sandy soil. Kjökkenmödding heaps are found on all kinds of soil, but it is very seldom, in fact never to my knowledge, that the poor, white, sandy soil yields, upon being turned up, any broken pottery, as is the case in the rich lands. *Per contra*, the residence of a large community for a great length of time on poor, white, sandy soil would necessarily enrich the land and give it a darker color; but it would also tend to an increased elevation and so form a kjökkenmödding, which simple cultivation would not do. Allowing that these rich fields where broken pottery is found had been under cultivation and been cleared of trees, we must go back for the age of these agricultural operations beyond the age of the trees now growing upon them, which, in many situations that have come under my observation, would exceed four or five hundred years. There are now growing upon these fields dense tropical forests, almost impenetrable jungles, with trees of immense size and age.

It is known that the Seminoles were agriculturists. In the Seminole war our armies found flourishing fields of corn and other crops, and the settlers often point out clearings in hummocks, with the great dead bodies of live oaks girdled and killed many years ago, as old Indian fields. These old giant live-oaks will last two or three generations when girdled and left standing. Broken pottery is also found in these places in profusion, but these fields are but small clearings in immense forests, whose soil, wherever opened, is found filled with pottery.

On Indian River, at the large shell mound situated at the mouth of the Banana River, on the beach, at the foot of the mound, an unfinished arrow-head of flint was found. It is the crudest article of flint manufacture that I have found, but it has evidently been worked by the hand of man. It has been smoothed by the action of the waves. Most of the pottery found is very rough and shows no marks. There is a great difference, however, in the composition of different pieces, some being made of very fine clay, and very compact and smooth, while others are very porous and disintegrating. One piece picked up is extremely hard, almost flinty, with a smooth polish on the inside. It is almost impossible to cut it with a knife. In color, some are black when cut and some light brown. One piece is a bright brick red on the outside third, showing evidently strong action of fire. A large piece, found in the large shell heap at the mouth of the Banana River, previously referred to, has still upon the outside the soot or crock from the fire. This was found buried nearly 8 feet from the top. None of the fragments found appear to contain any pounded shells and very litte sand.

I am informed by Mr. White, of Buffalo Bluff, a very intelligent settler, that a large iron ax was found imbedded in the heart of a dead live-oak upon his place, and that this oak had been dead as long as any of the settlers could remember. He also informed me that a stone phallus was found upon his place and is in the possession of a gentleman of Savannah. Dr. Joseph Jones, in Antiquities of Tennessee, mentions the occurrence there of similar specimens. At the large shell mound known as the "Wild-Boar Mound," in T. 30 S., R. 38 E., I found a perforated shell similar to the one described by Professor Wyman, on page 58, Fresh-water Shell Mounds of Florida, and figured in same Plate VIII, Fig. 2. It is a *Busycon carica*, 4¼ inches in length, at present, the beak being chipped and broken off. The hole in my specimen is round or nearly so, about eleven-sixteenths of an inch in diameter, made in the last turn, the nearest part of the circumference being 2 inches from the mouth. The spines are all broken or ground off, and the shell, at the mouth, is chipped. It looks as if it had been used as a mallet by inserting a stick in the hole for a handle.

I am informed by the Hon. Columbus Drew, ex-governor of Florida, that a golden spear-head was found in a mound in Orange County, Florida, along with an oval disk of silver. The spear-head was about 2¼ inches in length and 1¼ in width in the widest point. He stated that it appeared as if hammered out or formed by a somewhat unskillful workman. Its bullion value, as given by a jeweller, was $18. No marks of any kind appear on it. This interesting relic is still in his possession. The silver disk found with it appeared to have some marks or scratches upon it, but they could not be deciphered and the governor was not sure that they were intended for anything. This silver disk had unfortunately been cut in two by the ignorant discoverer, and, it is believed, a piece taken out for the purpose of ornamenting the stock of his gun.

It is highly desirable that these interesting relics be analyzed at the mint to discover, if possible, the kind of bullion of which they are made, and in this way show if they were made from Spanish or American coins, by the amount of alloy they contained. If from neither, but if composed of pure gold it would tend to show a much more ancient age for them.

In concluding this imperfect account of the prehistoric remains found in East Florida, it is proper to state that without doubt other mounds and remains exist undiscovered by me in the districts traversed. The almost impassable nature of a great part of the county, owing to the innumerable ponds, sloughs, brooks, and rivers, the cane-brakes, and impenetrable jungles filled with bamboo, grape, and numerous other vines, and tall palmetto, renders travel on foot, or in any conveyance except a boat, almost impossible. The density and luxuriance of the growth of these tropical forests hedges one in with an impenetrable wall, through which a bird can hardly fly, and in which vision is limited to a few feet around the explorer.

Of course, in these places it is only by chance the unguided explorer stumbles upon a mound. I am therefore very greatly indebted to the gentlemen I have named for information and for having left their occupation in many cases to act as guides.

Especially would I mention Mr. James H. Fry, of Pilatka; Frederick Lente, of Lake George; Mr. White, of Buffalo Bluff; Judge Bartlett, of Georgetown; Doctor Kenworthy, of Jacksonville; Mr. Wells, of Nashua; Mr. Scott, of Barker's Landing; Aaron Cleveland, C. E., of Merritt's Island; and Mr. Bradley, of Lake Worth. All evinced great interest in the objects of the expedition.

In summing up the results of the expedition, the paucity of relics will be remarked. It must, however, be remembered that the object was simply a reconnoissance and not a thorough examination. It was my desire to accurately determine and map the locations of as many stations as possible. It should be observed that between a point about 2 miles north of Pilatka and Lake George these remains are exceedingly numerous, a mound or shell heap occurring at about every half mile of the river. This portion of the State seems to have been much more thickly populated than any other examined. This region is a very fertile one, and is now more thickly populated by white settlers than almost any other. The wonderful accounts from the valley of the Kissimmee, and almost equally wonderful from the Ocklawaha, make an exploration or reconnaissance of these regions desirable. The geographical range and distribution of these people will go far towards clearing up the mystery of their origin and disappearance. Florida has undoubtedly in past ages sustained an immense population, and it is appropriate that the ruins of their cities and their imperishable monuments should be preserved, and their locations mapped, as a record of the march of nations.

GOLD, SILVER, AND OTHER ORNAMENTS FOUND IN FLORIDA.

By J. Francois Le Baron, *U. S. Engineer.*

The articles described in this paper were first brought to the notice of the writer by the Hon. Columbus Drew, sr., of Jacksonville, Fla., in the fall of 1882, who has kindly furnished the following account of the locality where they were found and their surroundings. The pieces belong to his son.

"The gold arrow-head and other pieces were found near the line dividing Polk and Orange Counties, Florida, about the year 1875. They were dug from a small mound in which they lay 3 or 4 feet deep, among many stone battle-clubs and hatchets (weighing altogether, perhaps, 100 or 200 pounds) with clay pots or pot-ware. The clubs and hatchets were given away to different parties soon after the relics were discovered. The remaining half of what seems to have been a triangular silver ornament, to be suspended by the small hole on the top, was cut off by a hunter to ornament his gun with. The half of the scissors was found with the other pieces. I feel quite certain as to the genuineness of the relics and the facts stated about them."

It was found to be impossible to obtain a regular assay of the pieces in Jacksonville. They were, however, referred to two jewelers in the city for examination.

Tests were made by Mr. J. Gumbinger, jeweler, of specimens No. 2 and 3 with acid and touchstone. He reported the spearhead No. 2 to be composed of 14-karat gold, having a bullion value of $19.04, and the miniature ax No. 3 to be of 20-karat gold and worth $6.

The other specimens, except the fragment of scissors No. 6, he considered to be silver, except possibly No. 9, which has somewhat the appearance of brittania-ware.

Mr. ——— Crosby, of Greenleaf & Co., jewelers, on the contrary, stated quite positively that Nos. 1, 5, and 9 were lead or pewter. No tests were made of any besides the gold pieces, except with a graver, as neither of the jewelers had proper appliances for testing silver.

My own examinations and conclusions as to the metallic character of the specimens I present in tabular form below:

No.	Metal.	Character.	Troy weight.			Specific gravity.	Remarks.
			oz.	*pwt.*	*gr.*		
1	Alloy of silver..	Cast........	1	12	16	10.051	Apparently an alloy of silver or britania-ware.
2	Gold..........	....	1	14	05	12.439	Dark red gold; apparently alloyed with copper.
3	....do..........	Hammered..	0	7	15	14.077	Bright yellow gold.
4	Silver..........	Cast	0	2	20	8.500	Undoubtedly silver.
5	Alloy of silver..	....do........	0	7	12	8.574	An alloy of silver or britania; much oxidized fragment of iron.
6	Iron..........	....	....	....	....	....	
7	Silver..........	Hammered..	0	0	05	....	Undoubtedly silver.
8	....do..........	....do........	0	0	15	......	Do.
9	Alloy of silver..	Cast.......	0	14	20	9.594	Doubtful silver; probably britania or other alloy.
10	Silver..........	Hammered..	0	0	04	....	Undoubtedly silver.

The specimens were carefully weighed. The specific gravity was determined by weighing in distilled water at a temperature of 65° Fah. Numbers 7, 8, and 10 are very thin, about the thickness of a wafer. No. 4 is about three one-hundredths of an inch in thickness. No. 1 is about five one-hundredths of an inch thick on the edge and about eight one-hundredths near the middle. The hole in the center has been beveled on one face of the specimen with some sharp cutting tool, the marks of which are discernible. It was evidently first cast, and has been rubbed down on the back, as presented in the drawing and photograph, apparently by the use of sand, the striæ being plainly discernible. The face presented in the photograph does not appear to have been treated in this way, but has the appearance of a casting. It is very much harder than lead, and a fresh cut does not tarnish. It is apparently brittle, having a crack nearly across its face. No. 8 is also cracked in much the same manner, and has no markings. No. 7 is unmarked in any way. No. 10 is pierced with a small hole near one apex, and there are numerous punctures on the edges, which do not, however, pass through. No. 4 is marked on the face with lines which were evidently made with a sharp pointed instrument, like a graver. The back shows the impress of a mold. It is perhaps the most interesting of the collection.

No. 5 is evidently a bullet, much harder than lead, which has been perforated with some sharp pointed tool, making a hole of large diameter at the two ends and smaller in the center, such as would naturally be made by a small penknife. The hole in this and also the two holes in the end of No. 9, are filled with a substance resembling rosin, which gives to the lizard-shaped specimen, No. 9, the effect of two brilliant eyes. This No. 9 has been broken in two places. It has been suggested that this singular shaped specimen served as a spoon or other instrument for eating, an idea suggested by its trough-shaped under side, which resembles a cheese-knife, such as is used by grocers. The material is hard and brittle, and there is a trace of gold in the tail end. Its thickness is eight one-hundredths of an inch in the center, one edge being considerably thicker than the other. This piece resembles the head of a cat-fish. No. 2 is eighteen one-hundredths of an inch thick in the center, and the edges have been rubbed down to about from six one-hundredths to eight-one-hundredths of an inch in thickness. The point is sharp. This is evidently cast, the indentations of a rather smooth mold, such as appears on the surface of smooth castings, being very plain, especially on one side. This appears also to have been rubbed down as with sand and water, and the edges beveled.

No. 3 is about three one-hundredths of an inch thick, somewhat thinner on the edge of the axe, and thicker at the top. It is evidently hammered, and is very smooth. Examining the specimens on the basis of their relative specific gravities, the low values found for the gold specimens is most noticeable. This shows them to be largely alloyed with much lighter metals, such as copper or brass, silver, &c. The alloys of the silver specimens are shown to be a lighter material than lead, as all the specimens proved to be lighter than silver; cast-silver being 10.474 (Ganat) and cast-lead 11.352 (Ganat). This shows them to be probably alloys of silver and zinc or tin, or both, or possibly nickel. These specimens were all probably used as amulets.

No. 9 has the only totemic resemblance. This may have been intended as an imperfect representation of a cat-fish or a lizard. Nos. 2 and 3 were probably of a class known as "ceremonial weapons," being too small and valuable for actual use in war or the chase, especially No. 3, but were used by the "medicine men" in their ceremonies.

On page 61 of the Archæological Collections of the United States National Museum * there is figured (Fig. 224) a copper celt from a mound near Lexington, Ky., which has a resemblance to our No. 3, although more than double the size.

On page 282 of the Eleventh Annual Report of the Peabody Museum of Archæology and Ethnology of Harvard University, there is shown (Fig. 6) a round silver ornament, taken from a mummy in the ancient cemetery at the bay of Chacota, Peru, and described by Mr. John H. Blake. This article has a close general resemblance to our No. 1, and is, as described, of the same material, although 1¼ inches larger in diameter. Like this specimen, ours is brittle, and the hole in the center is larger, but is countersunk in much the same manner. This Peruvian specimen appears to have been worn as an ornament around the neck. Unlike the Peruvian, ours has no marked indentations on the edge, and, judging from the description, the Peruvian was much thinner.

Discoidal ornaments of shell, stone, etc., are very numerous, and appear to have been universally popular with the aborigines. Many are figured in the volume on Archæology of Lieutenant Wheeler, United States Engineers, surveys west of the one hundredth meridian.

Judging of these specimens by their specific gravity, it appears certain that the gold ones at least, cannot have been made from coins unless a large amount of alloy has been added.

On page 298 of the Annual Report of the Smithsonian Institution for 1877 there is a description by Professor Rau of a gold ornament found in Florida. In his observations on this ornament Professor Rau states that there is no ground for supposing that the Indians north of Mexico possessed the art of casting gold. This would apparently point to Mexico as the probable origin of the gold specimen No. 2, which I think is undoubtedly cast, as I have stated in the table, for we would not suppose the whites to have manufactured a gold ornament of this shape; and, moreover, a close examination of the specimen will show a want of perfect symmetry, indicating it, with still greater probability, to be the work of the aborigines or Aztecs.

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* The Archæological Collection of the United States National Museum, in charge of the Smithsonian Institution, Washington, D. C. By CHARLES RAU. (No. 287.) Smithsonian Contributions to Knowledge, Vol. XXII.

SHELL-HEAPS OF CHARLOTTE HARBOR, FLORIDA.

By Dr. M. H. Simons, U. S. N.

Charlotte Harbor, on the Gulf coast of the Florida peninsula, is roughly estimated to be 30 miles long and 8 miles wide. It is separated from the open waters of the Gulf by a series of islands, which the constant surf is steadily washing away throughout their whole extent. Into the northern extremity of the harbor, Pease Creek empties, and near the southern end the Caloosahatchie River.

Charlotte Harbor is divided by Boca Grande Pass, and its channel into a northern and southern portion of nearly equal extent. The northern half has two channels, an outer between Boca Grande and Gasparilla, and an inner between Pease Creek mouth and Boca Grande. Between these are a tongue ot the mainland and several small keys. There are several extensive mud-flats, dry at low water, which afford feeding grounds for countless numbers of Grallatores, among which the roseate spoonbills are numerous, and the flamingo is not uncommon. On the tongue of land there are many marshy or swampy spots where *G. wilsonii* abound from December to March. I saw no mounds in the northern half of the harbor. The southern half contains more than sixty-five distinct keys. Pine Key, the largest, is some 12 miles long and 1 mile wide; Bird Key, the smallest, contains less than an acre. There are many reefs and shoals exposed at low water, and just awash at high; but the keys counted are from 4 to 6 feet above tide level naturally in the center, and fringed witn a heavy mangrove growth. I have visited twenty-five shell-heaps in this half of the harbor and feel perfectly secure in stating that there are as many more hidden by the mangrove growth on Pine Key and the keys in the inner channel.

In the southern part of the harbor there are also two channels. The inner, or Mattacha, runs between Pine Key and the mainland down to the mouth of the Caloosahatchie, and looks as if it might once have been the bed of Pease Creek; the outer or main channel runs between Pine Key and the outer or barrier keys. On the islands in the Mattacha Channel, and on that side of Pine Key, there are many accumulations of shells, some of large extent and several feet in thickness, but no conical mounds or ridges were seen. There are works of some description, however, on nearly every key in the outer or main channel, and these I shall now describe, beginning near Boca Grande and working south.

On the Gulf side of the outer keys there are no shell heaps, but along the inner channel there are six known to me. Their average height is about 6 feet above mean water, the upper 3 feet of which are of shells and fish-bones; the surface is irregular and varies from one to several acres in extent; they have been cut away extensively by shiftings of the channel. Mondongo Key, about two miles southeast of Boca Grande, is covered to a depth of 6 to 8 feet for half a mile in length and 100 yards in width; below the shells there is probably an equal depth of sand and clay; on its northeastern end there is a conical mound about 10 feet in height, which commands an extensive view.

Southeast of Mondongo is Patricio Key, which has a layer of shells over its surface for half a mile or more, but it is apparently a clay bank fifteen or more feet in height, precipitous on one side and sloping rapidly down to water-level on the other.

Less than a mile south is Useppa Key, whose northern extremity is a mud-bank 6 feet in height topped by shells to an equal amount; this widens out into a plateau about 100 yards wide, sloping to the westward. The island is over half a mile in length, and about half way down from the northern end the plateau forks, the eastern arm forming a ridge about 18 feet high facing the channel, the western forming a narrow flat ridge not over 10 feet high. Between and protected by these there is about an acre which is not over 6 feet above mean water, and at the southern extremity of this there is a space about 20 feet square, which is not over 2 feet above water-level, and was probably used by the Indians, as it is now by the Spanish fisherman, as a location for a well. It is protected east and west by a continuation of the ridge and plateau and on the south by a conical mound 15 feet or so in height. Abreast of this mound a boat channel, which runs down from Pease Creek channel between Pine and Patricio Keys to join the main one, comes close inshore, and probably has always been the landing place, for the ridge, plateau, and mound form a gentle slope to the water's edge; south of this there is another large irregular mound and a high plateau, quite flat, and about 2 acres in extent.

South of Useppa, about 3 miles, is Garden Key, which has a plateau in front rising gradually to an irregular oblong embankment on the north side, and to one of equal height, but greater length, on the south. The latter runs east for about 50 yards, then south about the same distance, and west for a little greater distance. Between the north and south ridges there is a spring-hole, or garden, half an acre in extent. Farther back, and protected by the ridges in front and on the sides, is a plateau of shells about an acre in extent and about 8 feet above mean water. South of Garden Key there is a key about 5 acres in extent, which has been raised throughout to a height of 8 or 10 feet.

Due east of Useppa, a little more than a mile, there is a group of mounds and ridges very similar to those on Garden Key, but much greater in extent—a plateau in front, then mounds or ridges flanking a spring-hole. One ridge runs parallel to the present beach but is crossed by another at right angles, the two protecting a plateau several acres in extent. These heaps are on Pine Key, and, from them, straight across the island to Mattacha Channel, there runs a canal or ditch which passes two ponds and another mound in the center of the island. This canal may have been a feeder to the ponds, as described by De Soto, but it also shortened the distance to Mattacha Channel fully 10 miles for canoes.

The shell mounds were formed by piling up the beach sand and then putting the shells on top as they accumulated. They were evidently the accumulations of ages, and were shaped as seen (conical mounds, ridges, and plateaus) to afford protection to the inhabitants during the high waters of hurricanes. In 1870 the water at Punta Rassa stood 8 feet deep over the beach on which the cable station is built. The beach is fully 4 feet above mean tide, so that the water rose 12 feet in less than twenty-four hours. The mounds also make splendid gardens, and, by giving sweep to the wind, afford the best of protection against mosquitoes and flies. The fact that the mounds and ridges do not form an inclosure shows that they were not intended as fortifications; they simply afforded places of safety from the flood and prevented the washing away of gardens and crops by it.

Many of the mounds have large trees growing on them, and the shells and bones in the center have been ground to dust, but others are made of shells, always broken, as hard as if gathered yesterday. There is an old trader among the Florida Indians, settled now at Key West, who told me that the Indians say that their ancestors built the mounds along the coast. He said, moreover, that the Florida Indians exactly resemble physically those of Cuba, but neither look at all like those of Mexico. A Charlotte Harbor settler told me that the present Florida Indians were, until the last few years, in the habit of coming down to the coast every fall and camping on the mounds to fish and to escape the sickly season on the mainland. He further said that these Indians are not Seminoles, but remnants of a tribe which occupied the country before the Seminoles moved down from farther north and conquered them. They are sun worshipers.

I went up the Caloosahatchie River 25 miles, and the Manatee 12, and neither saw nor heard of any fresh-water shell-mounds. There are shell heaps at Manatee and on the east coast at Mosquito Inlet, but they are oblong mounds with flat tops and are solitary. In a small one in Manatee village I was told that human bones were found, and with them some stone implements.

ANTIQUITIES IN WASHINGTON COUNTY, MARYLAND.

By JOHN P. SMITH, *of Sharpsburg, Md.*

In the vicinity of Sharpsburg there were mounds and earthworks, some of which have been destroyed, and others have been excavated and found to contain numerous archæological specimens. Tradition informs us that a most bloody affair occurred on the Antietam Creek, near its mouth, which is distant 3 miles south of Sharpsburg, more than a century ago, between those warlike tribes of savages, the Catawbas and Delawares. These tribes, it is said, were engaged in strife when this section of the country was first known, between 1730 and 1736, and they so continued for a long period subsequent. The evidences of this conflict are still apparent in the skeletons which from time to time are exhumed.

On the farm of Mr. William Hebb, distant 2 miles west of Sharpsburg, and near the Potomac River, vast quantities of arrow-heads, pestles, skinning-knives, and tomahawks of exquisite workmanship have been found. Mr. Hebb, one of the oldest inhabitants, remembers distinctly numerous earth mounds formerly on his farm; but the constant tilling of the land has obliterated all traces of them, so much so that it would be impossible for him to determine their exact location.

On the farm of Mr. Lafayette Miller, distant 1½ miles west of Sharpsburg, and adjoining the lands of Mr. Hebb, an abundance of stone implements have been brought to light. Mr. Miller has a number of them in his cabinet. These implements were found in the fields, and in some places they were particularly numerous. Some curiously wrought stones, perfectly round in shape, varying from 6 inches to 4 and 3 inches in diameter, and about 2 inches in thickness, have been found from time to time on this farm. The stones are perfectly flat on both sides and are polished.

A short distance from this farm, and bordering on the Potomac River, is the farm of Mr. Samuel Beeler. On this farm were two small stone mounds, one of them about 12 feet in length and 6 in width. They were composed of very small stones. One had been opened years ago; the other was excavated by the writer of this paper. The removal of the loose stone revealed a grave, which was very ingeniously constructed. The bottom of the grave was laid with large flat stone; the sides and ends also composed of the same. The covering was of large, flat stones, built in the form of the comb roof of a house. In this mound were found some bones, broken pieces of pottery, and a stone knife, now in the National Museum.

On the farm of the heirs of the late Jacob Miller, 2 miles south of Sharpsburg, on a high bluff bordering on the Potomac River, are two extensive stone mounds, which had been partly explored twenty years ago, and on a recent examination revealed bones, pottery, flints, etc. These mounds, as near as I can judge, were about 12 feet in length and 6 feet in height, and were entirely of stone. The interior was constructed in the same manner as those on the farm of Mr. Beeler above mentioned. The bones in these mounds were so much decayed that they crumbled on being handled. A few years ago some workmen were quarrying limestone near this mound when they came upon a skeleton which was buried in an upright position. At the head was a small vessel of pottery, holding about a quart, which fell to pieces on being handled.

About half a mile from this point, on the farm of Mr. William Blackford, several articles of pottery have been unearthed. Traces of some earth mounds are still to be seen, and beautifully finished arrow-heads are occasionally found.

On the lands of Mr. James Marker, 3 miles southeast of Sharpsburg, is a cave, which tradition says was used both as a dwelling and as a burial place. This cave is about 20 feet in diameter and 6 feet in height, and contains two rooms. The outer room has been partially explored. The opening to the inner room is so small as to be difficult of access. An examination of the cave last spring disclosed some flat stones, which were removed; and underneath them a large quantity of ashes, burnt bones, bead ornaments, arrow-heads, and flints were encountered. A few years ago a pipe of exquisite workmanship was found in this cave. It is situated on the banks of Antietam Creek, on a rocky bluff, and possesess every advantage for defense, accessibility to water, game, and other means of living. Several years ago a skeleton was found under a ledge of a rock near this place in a good state of preservation. I have also in my possession a pipe found on the banks of the Antietam near this cave.

Numerous changes have taken place in the streams and forests where once roamed the aborigines. The construction of the Chesapeake and Ohio Canal, which borders on the Potomac, destroyed a great many of the mounds and earth-works. Along the canal, at a place called Mercerville, 3 miles north of Sharpsburg, is an old, aboriginal burial ground containing half an acre. Last winter the writer visited this spot and found numerous pieces of pottery, bones, a few ornaments, and several stems of pipes. The bodies were buried about 2 feet below the surface. On an examination of the graves were found ashes and burnt bones, which led to the belief that cremation was practised by these people. Large trees were growing on the spot, which indicates plainly that this was an ancient burial site. The canal passes through a large part of it.

On the farm of Mr. Jacob McQuilkin, near Martinsburg, W. Va., are two large mounds, one of stone, which is about 12 feet in height and 20 feet in diameter; this one had been explored. The other mound is of earth, and is about 6 feet in height and 12 feet in diameter. Several large oak trees are growing in this mound, probably 40 feet in height and 2 feet in diameter. In the mound were found arrow-heads, fragments of pottery, some of which were very beautiful, also bones, and a large pestle formed of sandstone, 18 inches in length. These remains are located on a high cliff overhanging the Potomac River, commanding a fine view of the surrounding country. Around them occur an abundance of broken pottery and flint chippings. In one place twenty arrow-heads, all differently formed, were picked up. There can hardly be a doubt that this point was the lapidary of the aborigines. The arrow-heads found were of different colored stone as well as of different shapes and sizes.

On the farm of Dr. Whiting, in what is commonly known as "Whiting's Neck," a short distance from the farm of Mr. McQuilkin, are several large mounds. On the same farm is a large cave, which has been explored about 50 feet; it contains several rooms. In one of the rooms there were discovered bones and some arrow-heads. Tradition informs us that this was one of the dwellings of the aborigines, which seems plausible, from the numerous flint chippings which are scattered around.

On the farm of Mr. B. F. Harrison, adjoining the farm of Mr. McQuilkin, are numerous stone mounds and some earth-works, which have all been opened. These mounds, like all the rest described, are located on the high cliff land overlooking the Potomac River.

The dead were all buried with their heads towards the east, on a high point of land, and, in almost every instance, near a stream of water. Their burial places were in some romantic spot commanding a fine view of the surrounding country. All the mounds excavated by the writer have been found in just such spots.

SHELL HEAPS NEAR PROVINCETOWN, MASS.

Chas

By H. E. ~~Case~~, *of Brookline, Mass.*

In the report of the Smithsonian Institution for 1880, p. 441, it is stated that it is the desire of those engaged in collecting material for publishing a permanent work on archæology to learn the location and characteristics of all shell heaps, mounds, pueblos, etc., in the country.

Thinking it possible that some of the shell heaps which were visited by the author last summer may not be known to these persons, the following description is given of the Indian shell heaps, burying grounds, etc., in a stretch of country about 50 miles long, from Provincetown, Cape Cod, to Hyannis Port.

If attention had been solely given to shell heaps and the collection of Indian implements, no doubt a much better account could be given, for only a small portion of the route lay along the shore where Indian encampments were usually made. On the return from Provincetown, short excursions were made by small boats east and west from Hyannis Port along the southern shore, and later, a trip to Martha's Vineyard, where a few more places were located about Buzzard's Bay station. After leaving Provincetown, in crossing the fields about a mile and a half northwest of the Highland light, in North Truro, a chipped piece of quartz, the size of one's fist, was picked up with a half dozen splinters of the quartz lying near it. These were the first Indian chippings the writer had ever found, but the keeper of the signal station stated that not far from the spot where the chips were found, close by High Head, at the east end of East Harbor, there were large Indian shell heaps.

This spot, mentioned by Thoreau, is well known to collectors, and many implements of stone have been found there. In the railroad cuts, a short distance south of the North Truro station, there was reported to be an Indian burying ground. These railroad cuts are through little hills of modified drift, close to the shore, near two little ponds, and only a little way from the 113th milestone from Boston. In both these cuts were many traces of Indian settlements, such as broken and unfinished arrow and spear heads, scattered shells, chips of quartz, porphyry cores, and unworked pebbles of the same stone, together with bones, some of which were split lengthwise. The layer of earth in which these occurred varied from 1 to 2½ feet below the surface, the drift containing none except where the bank had washed down and mixed with the lower soil.

Although there were obtained no human bones here, yet the next day, at South Truro, the railroad section man in charge at the time the banks were cut through produced a fine arrow-head, and said that while digging in one place they found the bones of about three Indians, and got one good skull, besides a great number of stone chips and arrow-heads.

The next place where shells and arrow-heads occurred was at Wellfleet, at a cut a little north of the railroad bridge. In the rich black soil, about 6 inches below the upper edge of the cut, on both sides of the track, and in the earth thrown out of a trench in which railroad sleepers were placed on end to prevent snow drifting in, were found at least 2 quarts of stone chips and arrow-heads. With a few hours to give to the search and with one or two shovels to turn over the surface soil, this spot would very likely prove richer in implements than the North Truro locality. The latter place is much better known, and nearly everything has been picked up as fast as it washes out.

A little further on, close by the shore of Wellfleet Harbor, which puts in here, was found an arrow-head that had probably been shot at something, as the point was splintered by a direct blow on the tip.

On the bluffs along Wellfleet Harbor and on the plains at Orleans, off the road which runs south of the Brewster road, many arrow-heads have been found.

In parts of Brewster and on a little island near the source of Red River and upon its banks further down many old camps, arrow-making spots, and shell heaps have also been discovered.

The next day, at Harwich Port, was spent in hunting arrow-heads near the mouth and in the fields about Allen's River. No attempt was made to cross to Trous, the bluffs which lie just across on the west side of the stream, as it was not then known to be a good place for Indian relics. There were found here one hatchet-head, one spear-head, several arrow-heads, a shell heap containing charcoal and bones broken in lengths, besides a few scattered shells near the mouth of the stream. A letter from a person who accompanied this search states that, in the shell heap found that day, he has recently dug up ten more arrow-heads, some pieces of stone pots, and bones that look like deer antlers. He visited Trous also and found thirteen arrow-heads, a stone gouge, and a broken pipe. It is probable that Mr. Josiah Paive, of Harwich Port, has the best collection of Indian implements on Cape Cod, as many persons have spoken of his collection.

On the return to Hyannis Port, a methodical search was made for Indian relics in the vicinity of Barnstable and Yarmouth, all along the south shore of the cape, from Centreville River to Bass River. With the addition of a few places learned on the trip to Martha's Vineyard, the following list includes all the places seen this summer, where Indian camps have been pitched: Two railroad cuts at West Truro, described; one place at Wellfleet; at Harwich Port; along Swan Pond River; along Bass River; at Port Gammon; along a stream from mill pond in West Yarmouth; around Hall's Creek, at Squaw Island; at Centreville camp-meeting ground; along Centreville River; around Buttermilk Bay, the head of Buzzard's; on shore, just south of the two stations of Cataumet and Monument.

The west end of Martha's Vineyard proved to be another good field, for, near the base of Prospect Hill, in Chilmark, on the northeast slope, close by a small stream, were found, in a spot where the surface soil had been removed by floods or by the wind, great numbers of stone chippings, cores, and partly finished or broken arrow and spear heads, besides several well-defined circles of stones, blackened on the inside, which had undoubtedly served as fire-places.

Northeast of Menemsha Pond was one scattered shell-heap, and a few stone chips. Proceeding across Menemsha Bight to the Gay Head clay cliffs, Mr. Flanders, the boatman, stated that one day, some years ago, he found over eighty perfect arrow-heads in a bare spot over Squbucket beach, close by the club-house. A boy named Tilton, living near Prospect Hill, showed a collection of over a quart of perfect arrowheads which he had picked up mostly on the plowed fields.

On Cape Cod shells and black earth seem to be found wherever Indians have halted long or frequently. This layer of black is usually from 6 inches to 1 foot below the surface, but in one or two places it was fully 2 feet deep. Bass River, Centreville River, and Buttermilk Bay have the greatest shell heaps, and seem to have been settlements or regular stopping-places. The shells in the heaps are usually broken fine, and are often spread out thin, although, in one or two places, heaps occur 1 or 2 feet thick, and covering many square yards.

They are mostly quohoags, conchs, winkles, and clams, with very few or no scallops. Camps were almost always within easy reach of shoal salt water furnishing shell-fish, or between a fresh-water pond and the shore, or along the widest portions of the streams. Mixed with the stone chips and shells have never been found any substances of metal, except two small pieces cut in the shape of arrow-heads, which Professor Putnam, of the Peabody Museum, has determined to be of brass. These were found at Centreville and Buttermilk Bay. The following is a list of utensils, &c., that were found on the cape, either by the writer, or by his friends; arrow-heads and spear-heads; quiver and arrows that crumbled on exposure; axes, hatchets, and tomahawks of stone; leaf-shaped implements and skin scrapers; needles; graphite for marking; stone pestles and mortars; sinkers; stone-borers, gouges, and sharpening stones; stone pipes and pipe-stem (or bead); stone knives, broken stone pots of steatite and pots of clay; a sort of copper or brass breastplate, found on Captain Crawford's farm (Centreville), buried with a skeleton.

At Bass River, where the arrows were found in the quiver, while sinking a barrel-well, a man found Indian skeletons in two places, buried in a sitting or crouching position. With one of these were buried a stone knife, a spear-point, and arrows, which afterwards were purchased by a storekeeper of the place for a trifling sum. The position of these buried Indians is the same as that of others described as found on Cape Cod, Nantucket, and at Mattapoisett, and it seems to have been the general method before the whites came to these places. The skull of an Indian girl, probably sixteen to twenty years old, in the opinion of Professor Putnam, was given to us by some one who found it buried in a lying position, in an Indian burying-ground at Chilmark. The position, and presence of nails, very much decayed, but suggestive of a coffin, lead to the supposition that the burial must have taken place after the coming of the whites.

At Mashpee and Gay Head are to be seen the mixed descendants of the Indians, but here you can seldom see a strongly Indian face, for the negro features predominate, and many of the men when warmed up by whisky will break out into a real plantation song, thus showing a talent which their red ancestors are said never to have possessed.

The "History of Massachusetts" by John Warner Barber, contains more information about Indians on Cape Cod and Martha's Vineyard than is to be found in any other book, and a reference to it may be useful in determining the distribution of Indians in these places after settlement by the whites.

REPORT ON EXPLORATIONS IN CENTRAL AMERICA, IN 1881.

By Dr. J. F. Bransford, U. S. N.

VISIT TO COPAN.

Sir: I have the honor to make the following report of work done in Central America in 1881, in obedience to my instructions; first, to determine whether the Rio Copan could be used in the transportation of the monoliths from the ruins of Copan; second, to find if possible the source of the jadeite of Costa Rica.

Sailing from New York on December 24, 1881, I arrived at Aspinwall January 1, and San José, Guatemala, on the 8th. Next day the trip was made by rail from San José to Escuintla. The road runs through low land, almost perfectly level, for 18 miles, then rises by rather a sharp grade some 8 or 10 miles more to Escuintla. This town is about the same distance from the sea as Santa Lucia de Cotzumalquapa, just where the foot-hills begin, and the whole of this piedmont belt seems to be rich in antiquities. The ancient inhabitants of Central America were apparently fond of good scenery, especially when there might at the same time be enjoyed the advantages of a fertile soil. And these two conditions are nowhere more happily combined than in the foot-hills of the Pacific slope of Guatemala. From every coigne of vantage the eye may glance over the rich forests to the placid waters of the Pacific, while on the other hand the hills slope up towards the superb volcanoes de Agua and Fuego, which seem facing each other, each grand monarch mountain followed by a long line of retainers.

The soil, which is extremely rich, is, in the neighborhood of Escuintla, devoted principally to sugar, the coffee plantations appearing at a greater elevation. The road from Escuintla to Palen, always rising, winds its way among these plantations, at every turn unfolding a new beauty in landscape. At one point we were on the edge of a cliff, deep down below in a ravine—a sort of Watkins Glen on a grand scale—the river from Lake Amatitlan rushed and tumbled. It was near sunset, the light green of the fields of sugar-cane in the foreground were given fine effect by the dark forest beyond. The tops of the volcanoes were clear cut, but lower; ghost-like white clouds in silent succession loomed, and breaking away floated off seaward. Some fires had been burning in the lowland woods all day, and the smoke-laden atmosphere took on purple tints as the red sun slowly sank in the Pacific.

The volcan de Fuego, which was in active eruption in 1880, is rugged toward the peak, with ravines and patches of bare rock. The volcan de Agua is apparently wooded to the summit. The latter is easy of ascent; the former very difficult; but while I was in the country it was ascended by an English gentleman, Mr. Alfred P. Maudsley.

The valley of Amatitlan, between Palen and Guatemala City, is a garden spot of exquisite beauty. Beyond that another long hill took us up to the table-land of Guatemala, a parched and windy plateau, uninteresting, at least during the dry season, except for the mountains in the distance. One day had changed the climate from tropical to temperate. The direct rays of the sun were hot, but at night, or in the shade during the day, the temperature was cool and bracing.

The old village of Mixco was in sight before we reached the city; and on the left of the road, just before entering the gate, we found the plain covered with mounds for a square mile or more. One learned writer on Guatemala has described these as ant-hills.

On my presentation by the American minister to President Barrios, I was kindly received and promptly furnished with letters to the officials along the route of travel to Copan. These letters were signed by the President, and secured me every assistance possible on the trip. Under the strong administration of Barrios I journeyed in perfect security along the road where annoyance and danger so beset Mr. Stephens in the olden time.

On the 18th of January I left Guatemala for Copan at midday with an *arriero*, and rode as far as San José, on the Zacapa road. The way was through a barren hill country, some 5,000 feet above the sea. Evergreen scrub-oaks and pines were the predominating trees. The geological formation was volcanic, with tufa and lava showing in the cuts. Just before reaching the stream at Navajo, 3 miles short of San José, a vein of obsidian was seen crossing the road-bed, and the sharp-edged fragments of the bright and cutting *iztli* scattered around doubtless gave its name to the neighboring village. The road up the steep hill beyond was paved with blocks of stone, probably the work of colonial times. At several points along the road are standing in good preservation staunch monuments of Spanish work in the shape of stone bridges, high over ravines whose insignificant streams suggest no idea of the furious torrents of the wet season.

Mr. Stephens* gives a beautiful description of the park-like appearance of the environs of San José. Alas, the glory has departed, and left rather barren-looking hills surrounding a wretched hamlet, whose inhabitants live on the travelling public and the trains of mules and muleteers. I dismounted at the door of mine inn, every bone racking with fever, tumbled into a hammock, and took a drink of brandy and twenty grains of quinine. Two stalwart and rather fine-looking young ladies kept the establishment, but one was married and the other was pock-marked. Later a young bride and groom stretched their bed, consisting of a raw-hide, on the ground. The dogs and hogs shoved my hammock from side to side in querulous search for a comfortable resting-place, finally leaving me to the fever and the fleas.

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* I. L. Stephens: Incidents of Travel in Central America, Chiapas, and Yucatan.

At 5 o'clock next morning we sallied out on a most pleasant road, following the crest of a ridge with valleys falling away on either side. Near the road the *milpas* or patches of Indian corn flourished. Far away on the right were the mountains toward Honduras, and on the left beyond the valley of the Motagua rose the giant range of the Vera Paz. About 8 miles from San José we came to the edge of the plateau, and descended by a zigzag trail, among masses of limestone and blocks from the overlying basalt, to a tributary of the Motagua. Beyond this *Puente del Monte* for many miles the hills were barren. Then the desolation was varied by valleys at intervals, each with its small and miserable village. At one of these we stopped and had a good breakfast of corn-cakes (*tortillas*), beans, and eggs. After breakfast took a lazy swing in a hammock until 12 M., and then five hours to Guastatoya, where Mr. Stephens had his first experience in robber hunting. That night brought the luxury of a raw-hide bed, until 4 A. M., when we started again. About 2 miles more and we descended into the *callejou* of Guastatoya, a pass for 5 miles through a dismal gorge with steep hills or ravines on each side, where in the olden time the robber could attack with impunity and retreat with security, laughing at any attempted pursuit. It is when riding along such a road in the hour before daybreak, with an old *arriero* who at each dark thicket, or sharp turn, or silent cross, recalls a deed of blood enacted here in other days, that one feels inclined to pardon certain little irregularities so long as a strong government keeps its hand at the throat of the robber.

At half past 9 we reached Casaguastlan, and, riding up to the best-looking house in the village, were politely received by a *mestizo* lady. A few minutes later, hearing the appellation doctor from my *arriero*, she marched me right in to see her *hidalgo* who was suffering with liver and spleen. Result, a superb breakfast of beans, eggs, chicken, rice, and tortillas.

At dark we entered the miserable village of Eiote, and were directed to a stopping-place where, in answer to inquiries, we were assured that there was no bed, no supper, no feed for the mules, but there was a shed where my hammock might be swung among pigs and dogs and squalling brats. The *arriero* then started out to find a bundle of fodder at one house, an egg at another, and, strange to say. some coffee at a third. Before day next morning a girl started a fire and made coffee. Her beau crawled out from somewhere looking disgusted and miserable, and stood around rubbing his eyes to see that there was no flirting with the stranger.

At 9.30 a. m. on this the 21st of January we arrived at Zacapa. The road during the morning had been along the valley of the Motagua, past more frequent and larger villages. Just before entering the town we crossed the Rio Zacapa, a stream of interest to me, as it has the Rio

Copan for a tributary. The river at that time was some 40 yards wide and 6 inches deep, where it goes in rapids over a bar at the ford. Above and below, the width and depth are greater. After passing some strong rapids it empties into the Motagua, about 3 miles lower. Some 10 or 12 miles from Zacapa, Gualan is situated on the Motagua, at the head of navigation for boats of large size.

At Zacapa I was kindly received by Mr. Thomas Payne, an English merchant, who assisted me in securing mules and a guide for Copan. We started early next morning and kept up the river, leaving the road to Chiquimula, and following a trail which gradually ascended some 1,500 feet to a peak overlooking the valley of Zacapa on one hand, and on the other giving a fine view of the more distant Chiquimula. At the foot of this hill, toward the latter town, was the junction of the rivers Chiquimula and Jocotan, forming the Rio Zacapa. Turning and following the ridge in a northeasterly direction for awhile we changed our course again, and, descending, came to the bank of the Rio Jocotan at the foot of the rapids opposite the Peligro Negro. The latter, a cliff, is the end of the mountain which separates the valleys of Jocotan and Chiquimula. It is a sheer wall of rock between 2,000 and 3,000 feet high, and well deserves the name Black Danger. At this point my hope of utilizing the river for transportation of the Copan statues was at once dispelled. For 2 miles it rushes through a narrow and tortuous channel which it has cut in the rock, and the lightest canoe could not have passed at the time of my visit.

It is reported that occasionally during the wet season canoes pass successfully, but I doubt whether even then they can make the passage loaded. The rugged character of the hills forces the trail down to the bank here, and we had to follow the river some 4 or 5 miles until clear of the pass, then began to ascend again. These old Indian trails were famous for following the crest of the ridge, and frequently there was barely room for our sure-footed mules, the ground sometimes falling away abruptly on both sides. At midday we were well above the clouds. At lower points the gusts of wind would occasionally bring up a light cloud, and for a few minutes we would be enveloped in fog and misty rain. We were some 5,000 feet above the village and valley of Jocotan on the opposite side of the river. From that point of view it was the loveliest valley I had ever seen—a garden of *milpas* or patches of Indian corn and sugar-cane, and in some places coffee, on the hills. Cultivated land could be seen to the very mountain top wherever a bit of ground had been found not too steep for an Indian to stand on. This region gets much of the moisture borne on the winds which are turned away from Zacapa by the mountains northeast of that town. During the dry season the people of Zacapa, stifling in heat and dust, can look up and see the crest of the ridge veiled in mist, while cool showers occasionally come part of the way down the hills and then fade away in the face of the brazen valley.

On the hills we were crossing there were scattered superb, tall pines, apparently the yellow pine of the United States, and a great portion of the land was clothed in fine grass, which was supporting good cattle. Winding our way down again we came, at dusk, to a village of ten or fifteen houses perched half way up the mountain-side and rejoicing in the name of Mataxano. An Indian dialect was spoken by the inhabitants, but a man was found who understood Spanish. After visiting half the houses and considerable negotiation permission was obtained to swing my hammock under a shed, where I shivered in the raw, northeast wind all night. We had three eggs and a *tortilla* for supper and the same for breakfast next morning. Early in the morning we descended by a steep and dangerous trail to the river at the pass between Jocotan and Copan. Here again was a wild rush of water for 2 or 3 miles through a narrow and tortuous channel with immense bowlders strewn along its course. The river, here known as the Copan, flows through a narrow valley of more fertile land. Vegetation was richer; in some places irrigation was practised, and some fine cattle were noticed. In the afternoon we crossed a slight ridge clothed in pines and descended to the village of Copan.

The night was spent in the village, and next morning, January 24, the ruins one mile east were visited. My instructions to determine whether the Copan River could be used for transportation had been carried out, and then it was my duty to return to San José and catch the steamer of the 4th of February for Costa Rica, if possible. I therefore concluded to spend only one day here walking around the ruins, and by an occasional critical comparison of some object with the representation given in incidents of travel in Central America, Chiapas, and Yucatan, testing the work done by Stephens and Catherwood.

Along the road from the village to the ruins, antiquities are scattered and the dense forest on either side is without doubt the keeper of great archæological treasure. Once at the village of Copan any native will give the locality of the ruins, and once there, no guide is needed but Stephens. The thoroughness of the work done by Stephens and Catherwood has been confirmed by subsequent visitors and is a lasting rebuke to the imperfect methods of most investigators. There is one curious mistake, made, probably in copying notes—Stephens' plan of the ruins is turned around, and the north side is marked south. With the exception of these two errors the work of description and illustration is admirable.

Passing the statue O we struck the temple at the northwest corner. Where we ascended, near D, the steps were 16 inches high and 17 wide, in blocks of stone. We descended into the court at U. In the northwest corner were two vases in the shape of human heads, ornamented fantastically, and with bowls 9 inches in diameter and 6 inches deep. These are probably the heads which Stephens says were turned over and partially buried. The colossal head, figured on page 143, was in the same position leaning against a tree, and after thirty-two years there was very little change in the relative size of tree and head. After examining the *veutana* and ascending the wall overlooking the river, we pursued the passage V and returned by A. The drawing of the altar is excellent. I made a close examination of the hieroglyph in the upper right-hand corner of the side represented at page 141, and found the drawing exact except that there are thirteen knobs instead of the twelve given by Catherwood. Again, the characteristic prominence of the glabella, whence the nose and forehead sloped, forming an obtuse angle, is not sufficiently marked in the drawings. In other instances the minor details were hardly worked out with sufficient minuteness, a defect which was probably unavoidable in dealing with such a mass of minute and intricate ornamentation. The bold freedom of the sculpture is its most striking feature, and in some cases the undercutting leaves the ornamentation free, and several inches from the mass. The legs of some of the large figures are nearly free. I was prepared to see good work because of my faith in Stephens, but the boldness of it was beyond my expectation, and had to be seen to be appreciated. The figures in some places had been mutilated. The lip of that shown on page 136 had been broken and the chin broken off. The face looks out from a snake's mouth. About 60 feet northwest of B was the head of a large serpent, lying with other fragments at the foot of the slanting wall. In front of it, lying on the ground, was a tablet in four sections. The figure on it is looking over the right shoulder towards the head of the serpent. In the right hand is something spherical, possibly a head, which is apparently offered to the serpent. There were two other tablets similar to this, the three with the serpent head forming a square. The figure on the tablet is seated cross-legged, with a plumed turban, a mask, a necklace suspending a gorget, and a belt fastened in front with a circular gorget.

The statue C is 12 feet high, 4 across the front and 3 feet thick. Back of E, half way up the side of the pyramid—if it may so be called—the stones were in position and cut to form a smooth incline, the surface of which is covered with hieroglyphs.

We readily found all the large statues mentioned by Stephens except that at S, shown opposite page 151. In 1839 it was buried nearly out of sight, and I had no time to make a thorough search. In the deep cuttings on some of the statues were still remains of red paint. This was in positions protected from sun and rain, and in such a climate will probably last indefinitely.

About a mile west of the temple, in the village of Copan, is a mound some 40 feet high, at the west base of which are two altars with glyphs, &c. One of them has figures similar to those on the altar at A. On the south side is a double row of glyphs in the middle, with two human figures on each side facing in. On both east and west sides are four figures in profile sitting cross-legged and facing south, apparently followers of those first described. The north side has a perpendicular row of glyphs, on each side of which is one figure sitting facing in and offering something having the appearance of a head, just as on the tablets in front of the serpent's head at the temple. These figures had the characteristic large noses and retreating foreheads, with prominent glabellæ. Their ornaments are necklaces, cuff-like bracelets and anklets, and profuse plumes in the turban-like headdresses. Those on the sides have each in his hand something like a sheaf of wheat. On the top of the altar are other figures and hieroglyphs.

The ruins were visited by Mr. Alfred P. Maudsley in 1881. After photographing many of the objects, he testified to the excellence of the work of Stephens and Catherwood. I am sure that work will not be improved on until a party with apparatus for photographing and taking casts goes there to stay at least two months. Such a party, by intelligent exploration of the neighboring forest as well as the ground already known, might secure an enormous amount of material in a shape to be forever safe. If the hieroglyphs of Central America are ever to be deciphered it is of the utmost importance that every available specimen should be photographed and cast before the hand of ignorance or time renders their correct representation impossible. Here are the walls of a pyramid covered with inscriptions, altars, and statues with human figures and hieroglyphs, illustration and text, and the study of the one must assist in unraveling the mysteries of the other. Some of the monoliths have fallen in the last thirty years; others have been mutilated by the ignorant native, who, with a careless swing of his *machete*, knocks the nose off a statue to see if it breaks easily.

The road can be made sufficiently good for carts to Jocotan, thence to Chiquimula, Zacapa, and Gualan. At the last place we meet large *bonyos* and transportation to the sea.

According to Mr. McGee, of San José, who has been for years engaged in hauling in this country, a cart will carry one ton, a wagon two. Therefore one of the large statues 12 by 4 by 3 feet cut into two pieces might be transported on wagons, and cut into four, on carts. Two of the finest statues are fallen, one of which is broken just in half.

From Copan to Izabal $3 is the hire of a pack-mule carrying 200 pounds. From Izabal there is a small steamer which connects with the New Orleans line at Livingstone. Again, at less expense the objects might be transported by pack-mules to Gualan, and there embarked for the sea. Thus might be removed a large number of small objects, blocks on which are hieroglyphs, &c.

By using some discretion a camp might be selected near Copan, where a party could safely, if not comfortably, spend the months of February, March, and April.

The land in the valley seemed fertile, and a field of fine tobacco extended up to the west wall of the temple. Fruit was scarce, and pines grew close down to the valley. The last night of my stay I awoke in the wee small hours, chilled through. The northeast wind bore a cold mist, almost a drizzling rain. After dressing I wrapped myself in a blanket and again turned into my thick canvas hammock, only to shiver until daybreak. We left Copan early, and ascending the ridge, looked back to see the valley a lake of fog, above the surface of which the temple and the mound in the village rose like islands. This ridge is of the same rock as the statues, a soft, whitish trachyte, which hardens on exposure to air and sun. It may have been worked easily with flint implements.

After passing the Honduras line we left the valley, and turned to the right, ascending by a zig-zag trail. Near the crest of the ridge we struck the road, so-called, between Jocotan and Gualan, and kept it through the pass and down the other side. The pines on the south side became more lofty and scattered until near the top they were almost as thin as on a lawn, the shade not being dense enough to interfere with a rich growth of grass. Suddenly this vegetation gave way to dense forest matted with creepers. In place of the pines were innumerable varieties of tropical and semi-tropical trees, their leaves dripping with water from the mist. The road was miry, and the banks were graced with ferns. We had crossed the crest, and were seeing the effects of the moisture-laden northeast "trades."

Along the road at short intervals we met parties of Indians carrying heavy loads of corn or other merchandise on their backs, with hands across their foreheads, the loads resting on their hips. Down hill or on the level they go in a shambling trot, and make better time over the mountain roads than the mules do. Over a great part of the republic the mail is carried by Indians on foot. I was assured that by following more difficult but shorter trails, they made the trip from Copan to Zacapa in a day. It took me a day and a half and Mr. Stephens three and a half.

About 10 o'clock the morning after leaving Copan we reached the crest of the ridge east of Zacapa. As usual it was enveloped in thick mist, almost a rain. The trees were giant pines, draped in gray moss, and ferns were abundant. Descending a little we came to the lower edge of the canopy of mist, and looking out from under this curtain, we had the valleys of the Motagua and Zacapa in full view. Beyond was the great range of the Vera Paz in blue with strata of white clouds along the sides. Around us, all save the moss was green, and the ferns were dripping with moisture, while we looked through the vistas of the pines, with their festoons and streamers, at the scorched and glittering valley below. We were standing under the edge of the clouds, and less than 5 miles away the vegetation was parched and the leaves were gray with dust.

I was in the City of Guatemala on the evening of the 29th, and spent next day there. The collection of antiquities in the Museo Nacional was insignificant. I noticed the two tripods of the Luna ware described in Archæological Researches in Nicaragua;* there was no indication of their origin.

Mr. Edwin Rockstroh, professor in the Institute Nacional, was working in Indian philology with Berendt at the time of his death, and is prosecuting studies from which much may be expected by anthropologists. In 1881 he made a trip through the Peten and into the hitherto unexplored country of the Lacandones. He found them speaking a dialect of the Maya, and his Maya interpreter from Peten had no difficulty in understanding their language. Mr. Rockstroh discovered some ruins which he called Menché, which were afterward visited by Mr. Maudsley. M. Charnay found the latter there. The ecstatic Frenchman was in raptures, and dubbed poor Menché "Lorillard City."

Mr. Rockstroh told me the Lacandones, or rather more than half of them, had the peculiar profile of Copan and Palenque—large nose, prominent glabella, and retreating forehead. This gentleman presented for the Smithsonian a fine specimen of *pavo real*, whose habitat he informed me is between the Motagua and Zucatan, in the Vera Paz and Peten.

The afternoon of February 1 I rode 30 miles, from the Escuintla to the princely estate of Don Manuel Herrera, Pantaleone, and next morning, in company with my host, proceeded some 3 miles farther, to Santa Lucia. It is northwest of Escuintla, about the same distance from the sea, and in a region of similar topography. We found that the best of the objects mentioned by Habel had been removed to Berlin. Still several remained on and around a low mound. At one point were yet to be seen, *in situ*, blocks of stone forming steps up the side of the mound. These were 6 inches high and 18 inches wide. Most of the sculptures were in hard black lava. No. 9† was in granite, as were two or three blocks in the steps. I was informed that there was no granitic formation in this neighborhood.

The drawings of Habel were found to be good representations of the objects remaining. The drawing of No. 7 was excellent. Nos. 10 and 11 were good; 16 and 17 well drawn, except that details were not sufficiently worked out. No. 18 was not well drawn. These sculptures are in very low relief.

Returning to Pantaleone, I examined the figures which are mounted on the wall around the fountain. Facing the house on the opposite side of the fountain is one in hard, black basalt, 50 inches high, 43 inches wide, and 9 thick. It is a head with turban and plumes, the whole overtopped by a crest, which arches over to the front and ends in a fringe of tassels. There were large earrings; a gorget was suspended under the chin by a necklace. A fillet was on the brow at the edge of the turban. On the turban was a ribbon knotted in front, and above this a mask or ornament in shape of a face. Above were broad plumes, which looked like leaves. The face was the best work of art that I have seen by the ancient Americans, nor have I met with any specimen represented in the books to equal it. There was nothing conventional; the features were regular and well cut; the expression grave, dignified, regal.

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*Archæological Researches in Nicaragua; Smithsonian Contributions to Knowledge, No. 383, page 20.

†Habel.

One of the figures on the left had the beardlike ornament discussed by Habel.* It seemed not a beard, but a strap passed under the chin to hold on the head-dress. Next was the head of a women, with the eyeball hanging out of the socket on the cheek. The forehead was wrinkled and the face expressed acute pain. Next a man with both eyes hanging out. Here the expression was of sadness mixed with pain, as of one recently blind. Each face was distinctively individual, but all with high cheek bones, wrinkled brow, and stern expression. The woman had a small cap on one side of the head; the men wore turbans. They all originally had trunnions behind the neck for insertion into a wall. They were found by the *mayor domo* in some of his agricultural operations.

As remarked before, this belt of territory, at the foot of the western slope of the Guatemala Mountains, is extremely fertile; is almost covered with forest, and the objects at Santa Lucia, Pantaleone, and many other places reported near Escuintla indicate a rich field, awaiting the investigations of the archæologist.

The day after my arrival in Guatemala, Colonel Stewart, the American consul, presented some specimens of pottery, which were obtained from a mound about a mile and a half from San José, that was cut by the railroad. The specimens consist of No. 59380, a vase nearly complete, and the fragments numbered 59381, 59382, 59383, 59384, 59385, 59386, 59387. There is similarity in the biscuit and the degree of burning of the objects, and in certain features of ornamentation. The vase is 12 inches high and 13 across the top. The bowl only occupies about two-thirds of its depth. On each side is an ear, or handle, on the lower part of which is a button or flower-like form with a depression in the center. On the front of the vase is a rosette or bow in relief, the ends of which are free. This also has the button, the central depression in this case being filled by a flattened ball. The color is buff, with red bands and circles, and on each side is a crescent in red.

No. 59382 is a head, originally an ornament on a large vessel. The collector probably broke this off and saved it as curious. The face is of the type of many of the pottery figures here in the collection from Mexico. The head-dress is a coronet, with plumes above; the earrings of a flower form, shaped like the curved corolla of certain lilies; a banded necklace suspending a flower-shaped gorget, and an ornament suspended in the nose or upper lip graced this belle. The fragments are ornaments, probably of the same vessel; they are evidently representations of flowers.

The discovery of this Mexican pottery makes one more link in the corroborative evidence furnished by archæology in support of the traditions of a migration along this coast from the valley of Mexico toward Nicaragua—a migration which was so clearly traced by Dr. C. H. Berendt in his philological investigations.

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* Habel.

VISIT TO COSTA RICA.

We reached Punta Arenas, Costa Rica, February 16, and on the morning of the 19th embarked on a steam-launch bound up the Gulf of Nicoya. We got to the head of the gulf at 3 p. m., and our destination, Bolson, at 6.30 p. m. This place, the port of Santa Cruz, is on a creek which empties into the Tempisque. The little steamer arrived at high tide, and had a comfortable bed of mud in which to lie while waiting for the next rise.

From Bolson, with a man and three horses, the journey to Nicoya was made in seven hours. Found it the same dead Spanish town seen in 1877. A long church at one side of the *plaza* and rectangular streets, with eight or nine hundred inhabitants of all grades, from the pure Spaniard to the pure Indian. It is a fertile valley, with hills 500 to 800 feet high around it. Here was one of the most important towns found in Central America by the conquerors, and if we may judge by the relics with which the ground is sown in every direction we are inclined to credit the stories related by the old chroniclers of dense masses of population that owed allegiance to the cazique of Nicoya.

Riding up to the house at which I stopped in 1877, everything seemed as though I had left it but yesterday. The same old blacksmith-shop, and apparently the same old gray horse waiting to be shod. I had the good fortune to secure a room and a raw-hide bed, and madame engaged to feed me. Hernandez reports that no strangers have been here hunting for antiquities since my visit. And as the neighbors drop in one by one I have accounts of *huacas* enough to keep me at work for years. At Bolson similar reports were made, and subsequent investigations proved that there was no exaggeration in the accounts.

After two days spent in looking around and settling down, I rode with the padre, the alcalde, and jefe politico to some *huacas* at Pipal and Ochote, some 4 or 5 miles from Nicoya. There were several slightly raised mounds of loose stones, below which were the relics in shape of human bones, shards, and celts. The padre had made excavations in one or two places, but had not met with conspicuous success in obtaining entire vessels. The ground was of tough clay, and during the dry season was almost like brick; it was, therefore, rare luck for an object to escape the violence of the blows necessary in digging.

That night, headache and fever; next day, quinine and rest.

The 27th, with the padre and jefe, rode to Las Huacas, where rich fields were reported. The road lay along the valley as far as Matina, whence it began to rise, crossing one or two slight ridges and finally mounting by a steep zigzag some 2,000 feet to the plateau of Las

Huacas. From near Matina to and beyond Las Huacas are cuts and other remains of an old road supposed to antedate the conquest. Along its route cane and *pita* grows, marking its trail through forests, up and down hill, in straight lines, instead of the zigzag for easier grades, as would have been the case with Spanish roads. This road was like those in the mountains of Guatemala in their propensity to follow the crest of the ridge.

The next morning three men were set to work excavating at a point on the road to Matina, about 200 yards from the house of Angela Carrillo, where irregular piles of stones, forming elevations of 2 feet in height indicated *huacas*. Near the surface there were many fragments of *metates* of great variety and rollers. At this point hundreds of *metates* appeared to have been broken, and it seemed incredible that they should have been the results of accidental breakage, but rather as if in time of war sudden flight had become necessary and articles too heavy for easy transportation had here been rendered unfit for the enemy's use. Near the surface, and mixed with the stones, were fragments of the class attributed to the Chorategas in a paper on Nicaragua.* Lower were fragments of red painted pottery. At 51 inches depth the handsome argillite gorget No. 59849 was found, in the mouth of a red vase, No. 59811. The body of the vase was in fragments; it was apparently a water jar. The end of the gorget showed above the mouth. About 2 feet away and 19 inches lower was found No. 59850, which unfortunately was badly broken by the Macana. On a level with that and within 2 feet was the celt No. ——. The small vessels Nos. 59827, 59828, 59829 were found in the earth above the gorgets, and were probably associated with them in origin.

Among a great number of shards there were none of Luna ware.†

About a mile from Carrillo's, near the house of Mayorga, were many large huacas on the border of the old roadway.

That evening we returned to Nicoya, and the next few days were spent in hunting and interviewing old Indians, always with eyes and ears open for the green stone mine. There was an old man named Espiritu, living near Nicoya, of much shrewdness and native intellect. He took a great deal of interest in antiquities and questions concerning the old Indians. He reported that many of the old graves were seven or eight *varas* deep. A Frenchman who had spent several years in Chiriqui told me that the *huacas* were similar to those observed near Nicoya. Of course, the only possible way of discovering the source of the jadeite was by searching the ravines and cuts while hunting or riding, or by questioning the old Indian hunters and rubber-men. Many of these men become interested in what they saw I considered so important, and some later traveler may reap the reward in finding a guide to the jadeite mine.

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*Archæological Researches in Nicaragua, Smithsonian Contributions to Knowledge. No. 383, p. 80.

†Archæological Researches in Nicaragua, p. 80.

The padre and I made a trip to Santa Cruz on the 3d of March, returning next day. We heard great accounts of antiquities on the Pacific coast, and one small figure No. —— was obtained by purchase. One of the men who worked for me at Las Huacas brought Nos. —— ——, which he reported that he obtained working at the same place. Nos. —— —— were lying together beside a skull, and were, presumably, worn as a necklace.

With a party of about a dozen men the padre and I left Nicoya on the morning of the 6th, and following the road to Matina for awhile, turned to the right to Matambu, thence over a ridge into the valley of the Nosara, and camped on that stream at a place called Las Canillas, about a mile beyond the *castia* of Blas Lopez. This man Lopez had a great reputation for knowledge of the antiquities of the region, but was a very suspicious and surly Indian, and managed to keep to himself all that he knew of the *huacas*. Close by a mango tree, near our camp, some partial excavations had been made, and in one of them we commenced work. The first plateau, above the low grounds of the river, was some 25 feet above low water. In the edge of this the burials had been made, and the top of the grave covered to a depth of 3 feet with stones from the river-bed, the pile forming a slight mound now, after ages of settling, about 2 feet above the surface of the plateau. These resembled some graves seen on the Madera end of Ometepec.* The clay here was tough, but not so hard as at Las Huacas, as it contained more vegetable matter and was protected in the shade of the forest. In the surface soil and among the stones were fragments of pottery. Celt No. 59875 was 3 feet below the top of the mound, with the little vessel, No. 59883, near it. In a neighboring excavation was found a human skeleton and a celt, No. 59880. A mound larger than the others was some distance back of the edge of the plateau.

Discouraged by such poor results for two days of work, we transferred our camp some 3 miles further up the stream. Here in a higher plateau on the left side of the river similar piles of stones, hardly deserving the name of mounds, were seen on all sides. We were in the finest forest I had ever seen. Apparently not one of the magnificent trees in this valley had been cut since the conquest, except where for an acre or so in two places clearings had been made. The undergrowth was scanty, while high overhead there was a dense canopy supported by superb columns. The rays of the sun touched the ground at rare intervals, while at night a star here and there peeped through the foliage. Along the river innumerable frogs made night hideous with their croaking. Then owls and many night-birds of discordant note, reenforcing the howling monkeys, joined forces in the early night to convince the trembling greenhorn that all the ferocious beasts of the earth were assembled to sup on him. The mosquitoes, which were vicious the first two hours, suddenly disappeared, and the forest quieted down. The padre led off, and was followed by first one Indian and then another, with *cuentas* tales, after the style of those of the Arabian Nights, to amuse children. Wrapped in their blankets, one by one they fell aleep as the words of the last yarn died away in drowsy tones. Don Antonio freshened the fire and peered into the darkness to see whether a tiger were lurking around, then hugging close his gun and machete, sought repose. About midnight I awoke. The fire had died out, but it was not entirely safe to stir around for wood; there was the possibility of a tiger and the probability of a shot from Don Antonio. So I kept quiet, and began to feel the awful stillness of a tropical night in the forest; then from far away came the sound of a solemn moan, nearer and nearer, till with a sigh and a rustling of leaves a breath of wind passed overhead, and left the night as silent as before.

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*Archæological Researches in Nicaragua, p. 44.

Again we were doomed to bad luck. We worked two days at this place carrying the excavation to a depth of 6 feet with miserable results so far as securing specimens was concerned, and as there seemed nothing peculiar in the style of burial, as there was nothing more to eat less than half a day's journey away, we gave up the job as unprofitable.

A few days later I made a trip to Punta Arenas, via Bolson, and on the 15th took passage in a canoe from Punta Arenas for Puerto Jesus. Among the many delightful modes of traveling in Central America, the voyage in the dug-out deserves remembrance. There is no room to stretch one's legs under the most favorable circumstances, while on this occasion the boat was loaded, and I had to eat, sleep, and be as comfortable as I might for two days and a night on the top of two boxes that were not even. The second day we were becalmed at midday in the middle of the gulf, with not even a fleecy cloud between us and the sun. Then in the afternoon a stormy breeze sprang up and we were driven in on the rocky coast of Chira and had to drop our anchor, a large stone, to keep from going ashore. There we lay within 20 feet of the rocks bobbing and bouncing around so we could hardly sit up, for six or eight hours, till the weather moderated. About midnight, the second night we reached Puerto Jesus, the port of Nicoya, at the head of an *estero*, which can only be navigated by canoes at high tide. The rest of the night was spent on a raw-hide stretched on the ground, with musquitoes for company. Next morning on a hired mule some 12 or 15 miles to Nicoya.

The neighborhood of Santana was visited on the 18th. There was no lack of *huacas* as indicated by the low mounds scattered over the country. On the northern slope of the ridge between Nicoya and Santana there is a round top-hill, from which is a fine view over towards the Tempisque and the head of the gulf to the line of volcanoes in the distance. On this hill-top the *huacas* were marked by large stones, under which the relics were found at a depth of 3 to 5 feet. The burials in the valley seemed similar to those at Las Huacas and Las Carrillos.

Sunday, the 19th, was the feast day of the patron saint of the *barrio* of Las Huacas, and I visited it, arriving before sunset. There were sixty or seventy natives present, the guests of the family of Carrillo, who fed them well and furnished wine of the coyal palm as a beverage. Dancing and singing were kept up to a late hour, the padre as usual contributing his share towards the merry-making.

Next morning the padre and I with two men started on the trail used by rubber-men between Las Huacas and the Rio Oro. A horse had never been over this trail, and it required an expert guide to follow it. The padre and I were mounted, and were preceded by the men who trimmed a way for us with their machetes. For the first two hours we were on the plateau of Las Huacas between 2,000 and 3,000 feet above the sea. In the bed of a stream called Salto de los Perros, where it was crossed by the trail, there was a bowlder of hard basalt nearly 2 feet in diameter, on one side of which there were eight parallel grooves up and down, the widest and deepest of which was just of the width of an ordinary celt. The incline of this side was about 75°. I repeatedly noticed celts which had apparently been sharpened after use, and believe that this was a grindstone for that purpose.

From the edge of the plateau there was a steep break to the small Rio Medio, some 1,500 or more feet below. Off to the right there was a sheer wall over the edge of which poured a small stream. The Indians claim 3,000 feet for this fall, and it apparently was several hundred, the water breaking into mist towards the bottom. We descended along the edge of ridge, dismounted, and the poor horses slid a good part of the way on their haunches, one man leading and another driving. After reaching the stream we kept the bed of it; most of the way the horses were led, and slipped and stumbled over the bowlders as best they might. Occasionally short cuts were taken across bends, which were particularly enjoyed by me. In the morning while trying to ascend a steep bank my horse fell back and rolled over into the stream below. The stirrups were narrow and I could not free one foot, and in the struggle my foot was hurt so that I could not wear a shoe; so when in the afternoon I had to walk through these woods without a shoe, travelling was anything but pleasant. At last, late in the afternoon, the guide stopped at a camping ground after the most terrible trip in my experience. In the bed of this river Medio, a tributary of the Oro, black basalt formed the rock with veins of quartz. Right in our camp were killed an otter, a *pavon*, and two *pavos*. There were tracks of deer, tapir, and tigers. Below the camp green quartz appeared in the rock of the bed of the stream. During the day fragments of pottery were noticed several times where slight washes had occurred, or in the banks of ravines. My couch was of palm branches on the solid rock. About 1 a. m. next morning I was awakened by the swaying or horizontal motion of what I supposed a solid bedstead; the trees were waving in that not unusual occurrence, an earthquake. An hour and a half later there was another shock.

At 6.30 A. M. we started again, and in two hours of more pleasant travel reached the Rio Oro at the mouth of the Rio Medio, where we breakfasted in style on *pavo* and *camerones*. Between noon and 5 p. m. the descent of the Oro was made to the head of tide-water, within a mile of the sea.

The valley of the Rio Oro was narrow, with hills or mountains close up on either side. As with all these streams during the dry season, the water occupied but little of the broad bed, and we had rather a good roadway and excellent sites for camps, the banks furnishing grass for the horses.

The tide was low enough at 10 o'clock on the 22d, and we went to the mouth of the river. On the beach were a few pebbles of argillite as the nearest approach to jadeite. I had made the trip across the peninsula of Nicoya, carefully examining the rock at every opportunity, following the bed of the stream almost continuously from the divide to the sea, only to be disappointed once more.

A guide from Nicoya, who was to pilot us from this point, arrived about noon, but as the route lay for some distance mostly along the beach, we were constrained to return to our camp and pass another night there. A start was made at 6.15; at half past 11 we arrived at the Rio Buena Vista, some 2 miles above its mouth. The road was along the beach most of the way, and at several places we passed snug little harbors like that at San Juan del Sur Nicaragua. While the horses were resting, I took the guide and, wading down the river or scrambling through the thickets for about a mile, reached a point about 40 yards from the river where was a bank some 7 feet high, 40 yards long, and 20 wide, formed apparently almost entirely of fragments of red-painted pottery of large and small vessels. This was in a mangrove swamp, and the water at high tide came up to the foot of the bank. It looked as if thousands of vessels had been collected here and deliberately broken. No shells were mixed with the fragments, but most probably they were relics of repeated encampments here during the dry season for people from inland who came to feast on fish, turtle, &c.

We went a few miles up the Buena Vista and camped for the night, that is, we cut some palm leaves on which our blankets were spread, and we considered ourselves in camp. We had not killed any game since the morning before, and our commissary stores were running quite low. Sardines and the tender buds of a small variety of palm made our dinner. Next morning a small allowance of the same luxuries, and we started on a forced march for Nicoya and something to eat. At noon we stopped on a small stream for lunch, my portion of which consisted of half a sardine and a palm bud. The trail all day lay over rocky hills where the vegetation showed that the soil was unusually poor for that country. Late in the afternoon we reached the small collection of houses at Lazartito, within 10 miles of Nicoya, where was the first hut we had seen since leaving Las Huacas.

As usual after such a trip I was ill for a day or two with fever and dysentery, but after resting Saturday was in condition to take the saddle again at 2 P. M. on Sunday for Bolson and Punta Arenas.

Early on the morning of March 29, I was called for my trip to San José. I was in a room on the second floor of the hotel at Punta Arenas, sitting on the edge of my cot when the room began to rock like a boat in a sea-way. The tiles on the roof rattled and danced overhead, and outside the tops of the trees lashed the air as if shaken by a giant hand; the chickens cackled, and women rushed screaming into the streets. It was the heaviest earthquake of my experience, and I in an upstairs room with the door locked; but in a frame house built with an eye to resisting just such strains there was little danger of accident.

The road was along the beach for 8 or 10 miles, then struck inland and began to ascend. By much labor on my lazy mule, I made more than half the distance, and slept at Atena. A ride of three hours next morning took me to Alajuela, a town at the western end of the valley of San José, from which a railroad passing through the principal towns extends eastward to Cartago. The valley is some 4,000 feet above the sea, and surrounded by mountains rising several thousand more, the peak ——— being ——— feet in elevation. This is one of the finest coffee-growing regions in the world, and the superb plantations, with here and there a town or village, and in every direction a background of mountain range or volcanic peak, make up landscapes as fair to view as any beneath the sun.

On my arrival at San José I was met by Mr. Minor C. Keith, a young American, who had been in Costa Rica some ten years, and who had by pluck and perseverance at last completed a railroad from Port Limon on the Atlantic to a point within 25 miles of the capital. The intervening distance was covered by a cart road which he was then finishing. These gave a continuous line from San José to the sea with much cutting, and I accepted Mr. Keith's invitation to accompany him over the roads.

One of the ministers, Mr. Sanez, who, in the absence of the President, was in charge, received me most kindly, gave directions for facilitating my work, and promised permission for the *jefe politico* of Nicoya to accompany me for one month on my explorations. I was also introduced to Don Leon Fernandez, who was in charge of the Government archives and then engaged in his work "Documentos para la Historia de Costa Rica," the first volume of which was out.* Señor Fernandez was found an enthusiastic antiquarian and historian. The chapters of his work first came out in the official gazette, in addition to the ordinary circulation, of which copies were sent to the officials in all parts of the republic, and everywhere awakened an interest in antiquities and the history of the Indians, which must work valuable results. Repeatedly I had co-operation which was due to the interest excited by these papers. In company with this gentleman I called on the bishop of Costa Ríca, who, while interested in anthropology, was especially fond of ornithology. In his collection were jadeites, one very fine, and several specimens in argillite and marble. These two gentlemen were to start in about a week on a Government expedition for exploration in the country of the Guatuso, or Rio Frio Indians, and kindly invited me to join them. Here was a rare opportunity, but on consideration I concluded to stick to my instructions and give my time to the department of Liberia.*

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*The second volume has since appeared.

April 4, we (Keith, some half-dozen Costa Rica gentlemen, and I) left San José for Port Limon. We crossed the ridge between the central valley or plateau and the Atlantic slope, and took breakfast at one of the stations of the parties building the cart road. This was a graded road which followed a stream in its rapid but tortuous descent through the mountains to the point where the railroad entered the gorge and crossed the Rio Lucio. An extra train was made up in the evening, and we made a night trip of a few hours to Port Limon, distance 71 miles. At the upper end of a curved beach is a promontory formed of coral rock, and off this an island making a very beautiful harbor. There were no antiquities found in this neighborhood, but in the storehouse of Mr. Keith was a collection made along the line of the railroad, and several people in the town had very pretty specimens from the same source. Mr. Keith agreed to send his to the Smithsonian by his brig Nile on her next trip to New York, so I spent the 6th hard at work packing.

We were back in San José on the 8th, and in San Mateo, on the road to Punta Arenas on the 10th, and sailed in a dug-out for Puerto Jesus on the 11th at midday. The first showers of the coming wet season had been at Alajuela as I passed on the 9th, and I found the road from Jesus to Nicoya in some places miry from the heavy shower of the evening of the 12th. The ride was made at night, and progress in the intense darkness was only made practicable by a lantern carried by my companion. Three o'clock the morning of the 13th found me at Nicoya. I had not had a night's rest for six nights, and the well-deserved fever promptly made its call. The northeast wind came up strong again and blew the wet season back for another two weeks.

The leave of absence for the *jefe politico*, Don Juan José Mata-Rita, not having arrived, he and I went to Santana on the 20th to make some investigations in the *huacas* of that place. As around Nicoya and Canillas, they were indicated by low piles of stones, principally limestone from the neighboring hills. These piles only rose 1 or 2 feet above the surface. Commencing excavation in one, the stones were found for first 3 feet, at the bottom of which were human bones and some fragments of Chorotega pottery. Lower still was the hard clay of this section. In one place the excavation was carried to a depth of 6 feet; pieces of coarse pottery were found near the bottom, where apparently undisturbed clay discouraged further digging. In neighboring *huacas* were found some fine specimens a few years ago. One of them, No. 59891, which was afterwards broken, was secured and mended. It is well burned, light, and strong, and altogether a very fine specimen of old Indian work.

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* In November, Don Leon wrote me a most interesting letter informing me of their success.

The afternoon of the 22d of April I started on an extended trip accompanied by Don Juan Mata-Rita, the *jefe politico*. Before leaving the Department of Nicoya the fragment of a figure in argillite was obtained at Savana Grande. There was much pretty quartz in the ridge which separates Nicoya from Santa Cruz. We spent the night at the latter place, and, furnished with letters from the jefe to the officials of his department along our proposed route, we resumed our journey in the morning towards the Pacific. For some miles the road was along the plain of Santa Cruz, and then we crossed a ridge not more than 200 or 300 feet high, and entered the township or *barrio* of El Gallo (the cock). The game-cocks of El Gallo, who are mostly smugglers, got into some trouble a few years since, and the name of the *barrio* was changed to El Veinte-Siete de Abril, the anniversary of President Guardia's accession to power. The land here was very poor, and the inhabitants correspondingly wretched. The business of smuggling over the Nicaragua line helps them in their struggle. These people at once took us for Government officers in search of *contraband*, and viewed every act and word with suspicion. They apparently had forgotten how to tell the truth, and really seemed the greatest liars on the face of the earth. While sitting on our horses at the door of a hut with the whole family protesting that they had never heard of any relics of antiquity in that region, we pointed out fragments of pottery, etc., in a bank not 20 feet away, and we knew that at the time these people had some good specimens in their house, but they could not conceive such folly as two men traveling in these parts merely in search of old pots; believed us to be revenue officers, and did not wish to give us any pretext for remaining in their neighborhood. But in this abominable *barrio* we had a most delightful surprise. Riding up to the house of the school-master, we presented our letter and were received with charming courtesy. There were two school-houses, one for girls the other for boys, on opposite sides of a *plaza*. Between the two and a little back was the domicile of the teacher, all in bamboo, and so neat and new, for a moment I thought I was back in Japan. He was a *mestizo* of excellent manner and tolerable education. His wife managed domestic affairs, while a daughter of seventeen years relieved him of the girl school. She was an exquisite specimen of the *mestiza señorita*, slender and graceful as a wand, with hands and feet of a sylph, and eyes so large and so soft—verily I did want to go to school again, and if there had only been the excuse of some decent *huacas* in the neighborhood, the worthy dominie would have had me for a guest for some time.

The alcalde, after having our horses attended to by his policeman, escorted us around the neighborhood in search of antiquities, but we only secured a few specimens of extremely rude ware. The ancient inhabitants were no doubt as miserable as those now here, and probably could ill afford the extravagance of jadeite ornaments.

Next morning, with the policeman as guide, we pursued our journey to Santa Rosa, where were two more schools. Don Juan wore an argillite gorget suspended around his neck, and this was shown the children, and one little fellow said there were things like that at his house, and we decided to accompany him to his home. Before his school hours were over he had been so frightened by suspicious natives that it was with the utmost difficulty we persuaded him to accompany us. On the road we met a man and asked him the usual question, if he could tell us where to find *huacas*, when he stepped back aghast and with the most ludicrous expression of alarm, exclaimed "*Huacas*! the Lord preserve me! What do I know about *huacas?*" I have travelled a great deal in Central America, but never before saw a place where ignorance and suspicions put such obstacles in the way of simple investigations. The trials of a foreigner travelling alone may be imagined, when it is remembered that I was accompanied by Don Juan himself, a nearly pure blood Indian, who was born and raised in the Nicoya and was *jefe politico* of that district.

Some 5 or 6 miles more and we stopped at a cattle ranch of the rudest class—three miserable cane huts near by a corral for such cattle as needed attention, and an inclosed area of a few acres for maize and plantains. The proprietor, owner of a large number of cattle, was here, and lived as poorly as his meanest *vaquero*. The morning of the 25th April we rode to within a short distance of the sea to examine an old burial ground. The graves were indicated by slight piles of stone, showing but little above the surface. There is very little soil above the rock here and the relics, human bones, extremely rude pottery, celts, and broken grinders were found within 15 inches of the surface. This was on a slope, and apparently the surface had been much denuded by the wash of the wet seasons. One skeleton was extended with head to southwest; on one side of the skull was a celt, edge down, on the other a small rude vessel in pottery. Of eight celts collected, all but one were blunt, the edge apparently chipped off to render the implement useless. The one excepted was a very small one. The collection, interesting for the very rudeness of the pottery made here, was intrusted to the school-master at Santa Rosa, who failed to forward it to Santa Cruz and it was lost. That worthy was as stupid and ill-mannered as his colleague at El Gallo was pleasant and courteous.

We only worked at that place half a day, then returned via the ranch to Santa Rosa, and thence to a small hamlet, Las Huacas, on the route towards Sardinal country, of the same wretched character. Next day, about noon, after touching the coast west of Cape Vela, we struck the barrio of Sardinal, and were at once in a different country. Evidences of greater prosperity were apparent on every side, and besides, at the first house a specimen in green stone, argillite No. ——, was obtained. Proceeding along the valley the houses became more frequent until near that of Don Pizarro; it was rather after the order of a scattered village. Here nearly two days were spent riding from house to house, and rarely inquiring in vain for *antiquedades*. Some objects in stone, usually, if not always, gorgets, were secured, besides a pretty collection of pottery.

The afternoon of the 28th we crossed the ridge between Sardinal and the bay of Culebra to a place called Panama, near the mouth of the bay. Here at the house of —— Pizarro* we got Nos —— ——. Near the road from that house to the beach were lying two fine images in the Zapaterra style† about 6 feet high, with the head of a serpent for a head-dress. The head of one was broken off. It was the finest specimen of that class that I had ever seen. Nearer the beach in the bank of a stream was a lot of pottery fragments, as in the Buena Vista, and near by a section of a shell heap which had been covered by alluvium.

Staying at the house of —— Espinosa that night, next morning we visited the *huaca* of Panama, on a hill overlooking the bay. At the edge of a mangrove swamp near the foot of this hill was a bank about 8 feet high and 30 by 50 yards surface, composed, as at Buena Vista, almost entirely of shards. On this bank stood a *pochate* tree 6 feet in diameter, at 10 feet above the surface. There was another near by, the two forming islands occasionally in very high tides. On the beach near by were some Chiriqui Indian women in bivouac, the mates of some pearl fishermen, and they, on a small scale, were building their shell-heap, and furnishing an illustration of how these immense banks of pottery and others of shell may have grown in the old times. Shells were not mixed with the shards in the large banks. The fragments, as at Buena Vista, were almost all of unpainted ware, or that which was only painted solid red; but there were a few pieces in yellow ornamentation, or in bands of black or dark brown. The most ordinary pieces were well burned.

Just south of these banks the hill of the *huacas* rises some 150 or 200 feet, culminating in a point which overlooks sea and land for miles around. The valley of Panama runs off inland, and to the north stretches the beautiful bay of Culebra, the *hacienda* of Culebra bearing north 10° east. On the top of this hill was the finest *huaca* yet seen. The graves had on them stones in pieces about a foot in diameter. Many of these had been opened, and a great many objects were reported to have been obtained. The burials were shallow, the excavations being only about 3 feet in depth. Scattered around were bones, fragments of handsome metates, and numberless shards of painted ware, celts, etc. Among the remains were some pieces of large jars. A head in green argillite was found, but there were no specimens of the Santa Helena ware seen at Ometepec and supposed to have been of Aztec manufacture.*

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* I mention the names of these houses to facilitate the work of other investigators.

† Squier.

In the evening we rode to the *hacienda* El Iovo, and spent a quiet day with Don David Hurtado. The owner of the *hacienda*, Jesus Maria, dined with us and after giving accounts of shell heaps, stone images, etc., told of a large block between his place and Nagascola, on which were carved the sun, moon, and other figures. The morning of May 1 we rode to Jesus Maria and accompanied the hidalgo in search of his remarkable monolith. About midday we found a quarry of columnar rock, whitish and soft; near it lay the object of our search, found after hours of riding over hills parched by the sun and wind of the dry season, and on this precious stone seemed concentrated the rays of the tropic sun. We dismounted and walked around it in search of hieroglyphs. There were sundry marks and scratches as if a careless cowboy had made this his seat and scraped his spurs against the side. Oh!——We remounted and turned our horses homeward, and conversation was not animated for some hours.

The explorer who goes to Spanish-America and lends a willing ear to the yarns of the natives, will follow a will-o'-the-wisp from Texas to Cape Horn, and return empty handed. I have accomplished little except when I have settled down at a point and by laborious investigation ferreted out whatever of archæological treasure was stored around, sometimes to the great suprise of natives, who, born and raised in the neighborhood, had never suspected the existence of the *antiquedades*.

May the 2d we rode to the *hacienda* San Raphael, 6 miles north of El Jovo. The burials here were in a clump of trees on a slight elevation above the plain, where enough of soil had accumulated above the lava rock to support something more than the usual coat of grass. The burials were not more than 2 feet below surface. A vase 12 inches deep, 16 in diameter ,and 3¾ across the mouth, contained burnt human bones. The guide said that he found another here containing bones, and in other cases fragments of large jars with bones. There were lying around celts, fragments of red unpainted ware and of finely worked *metates*. The graves were indicated by large stones.

Continuing our journey to the northward, we visited the *hacienda* Pelon, where on a slight eminence about a mile north of the house were seen *huacas* like those seen in 1877 opposite Boquerones.† The pottery was in some cases painted red. There was a fragment of coarse ware, 1¼ inches thick, which must have been part of an immense vessel, judging by the curve. The guide reported the finding here of large jars 3 feet high, containing bones and charcoal. The two objects ——— and ——— were found in the loose dirt of an excavation.

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* Archæological researches in Nicaragua, pp. 55, 80.

† Archæological Researches in Nicaragua p. 74.

We left Pelon at 4 P. M., and at dusk were at the Rio Deshozados, where some fodder was obtained for the horses and some corn cakes and eggs for ourselves. After a bath in the sparkling rapids, I spread my blanket on the ground and looked up at the stars until tired "nature's sweet restorer" got ahead of the noise of laughter and chatter made by an Indian wench and her beaus. We were up at 3 A. M. and took the road again for Liberia, where we spent the midday hours. It was a lifeless little town, the capital of this department, with its white houses and streets glaring in the sunshine. We were shown a handsome vase of Luna ware, the prettiest specimen of ancient American ware I have ever seen; but could not purchase it, and, as the owner was absent, could not get a history of its origin. A good specimen of a Choratega vase was presented, with the information that it was exhumed at Nagascola, in Culebra Bay.

In the afternoon we rode some 15 or 20 miles to Boquerones. Next morning, securing fresh horses, we visited the hamlet of Communidad, up the river. There and in Boquerones were securéd four small *chalchihuitls.* That afternoon we stopped at Siete Cuerros, on the road to Santa Cruz, and obtained a broken tripod of Luna ware, which was said to have been the cover of a vase found in the burial ground some miles lower, on the west side of the Tempisque. There were also some fragments of Santa Helena and Choratega ware, which I was informed were found at the same place, as they were near the Luna burials, Ometepec.

May the 5th we got back to Nicoya, and after the excitement of the trip came fever and dysentery. I was pretty well used up; the wet season was beginning and I determined to leave. Sending special messengers to Boquerones for the objects there, the collection was packed and taken to Punta Arenas, whence I sailed on the 13th.

To Prof. SPENCER F. BAIRD,
Secretary Smithsonian Institution.

ABSTRACTS FROM ANTHROPOLOGICAL CORRESPONDENCE.

EDITED BY OTIS T. MASON.

The archæological work of the Bureau of Ethnology withdraws a great deal of material formerly published under this head. The danger of losing facts in a great mass of current correspondence, however, makes it advisable to publish brief abstracts of letters in this form:

Baxter, J.—Reports opening a grave on the shores of the Gulf of St. Lawrence, 40 miles from Chatham, N. B., and finding the skeleton of a large man. The head was covered with a sealskin cap and the feet with moccasins of the same material. There were pieces of canvas and birch bark about the remains, and inclosed within these a piece of Spanish cedar and a short piece of rope, "served," as though it had been a piece of standing rigging. Over the body were three large copper kettles, overturned, one over the head, the largest over the body, and the third over the flexed extremities.

Brown, E. L.—Reports several groups of mounds near Durand, Wis. On the farm of the writer, at the depth of about 6 inches, are found old fire-beds of burnt rock and ashes, pottery, and arrow-heads. In the village of Durand is a group of twelve burial mounds. On the bank of Bear Creek, 2½ miles east of Durand, near a grist-mill, is a group of seven mounds in a row, extending north and south. In the town of Nelson, Buffalo County, are several groups of mounds, one hundred and fifty altogether. The mounds are generally located on the river terraces in groups. They are composed of sand and drift, not stratified. Several mounds have been explored. On the rocks near Dumaville, Wis., are figures of canoes and animals. The dead buried in the mounds are in a sitting posture, facing the east. The remains are entirely decayed. North of Durand, in *Ojalla*, two caches have been found, one containing about seventy-five large chipped disks; the other one hundred, in various stages of completion. Mr. Brown will make further researches for the Smithsonian Institution.

Burns, Frank.—Reports a cave near Blountsville, Ala., in a cliff of limestone. It was formerly a burial place, as a number of skeletons were found deposited in wooden troughs. The bodies had been wrapped in some sort of matting made of bark. Twelve ornaments of native copper rudely hammered out and two chisels were found there, as well as sea shells. The cave was dug over during the civil war for the purpose of extracting saltpeter. The writer also reports the discovery of a cache of seventeen chipped spear heads in a field near Blountsville. The specimens are said to be beautifully wrought.

Gray, William.—Is studying the prehistoric relics of Kingsbury County, Dakota Territory. Many evidences of ancient habitation exist here and should be saved to history while they are accessible.

Luttrell, Elston.—In Calhoun and Talladega Counties, Alabama, mounds, stone implements, sculptures, &c., abound. Two and a half miles east, and thence five-eighths of a mile south from Oxford, Calhoun County, is a large isolated mound. It lies about 300 yards from Choccolocco Creek, on the Caver place. It has never been examined; it is about 20 feet in vertical height, and has a large, flat surface on top. The perimeter is an ellipse, the major axis of which is about 100 feet and the minor axis about 75 feet. On the west side, a few feet from the base, is an excavation or mardelle. The interior has never been examined. There is a group of mounds, orderly arranged, 15 miles southwest of Oxford. They lie on the south bank of Choccolocco Creek. Pipes and stone implements are found in the vicinity. At the Elston Store place, in an excavation for a cellar, a body was found buried in a sitting posture, and many stone implements were also found in the grave.

Mackie, Joseph S.—Writes from Lima, Peru, describing observations made at Chorillo, on the coast, at a point forming an equilateral triangle with Callao and Lima. Passing up the sandy hillside on one occasion he observed a scrap of cloth protruding, and immediately dug it out. The fabric was of the peculiar Peruvian embroidery, on which were wrought fierce animals in a threatening attitude. Inclosed was the mummy of a female child not more than two days old. The continuation of the digging revealed a large quantity of bones wrapped in nets, the bundles resembling dumb-bells—the head at one end, the long bones in the middle, and the small bones at the other end.

MacLean, J. P., writing about the great Cahokia mound, says:

"Almost everywhere on its sides you can pick up fragments of pottery, broken bones, and white or milk chert chips. Some of the pottery is decorated. I found the frontal bone of a human skull on the side of the mound.

"In vol. II, Peabody Museum Report, p. 474, will be found a cut of the Cahokia mound. While this restoration is a good one, yet it is not accurate. I came to the opinion that on this mound were four temples, representing four orders of priests, the highest order erecting their temple on the upper platform.

"The lowest platform is not a graded way, as represented by Ancient Monuments, page 174. No evidence of a graded way presents itself at any place. On the west side I discovered traces of baked bricks.

"Professor Putnam is guilty of an amusing oversight (p. 471) in calling attention to the fact that its exact location is not given by writers who have attempted to describe the mound, and then neglects to do so himself, although he visited it. It is located in Madison County, Illinois, on the south boundary of Namioka township, 6 miles east of East Saint Louis, on the road leading to Collinsville."

Moore, J. H.—Reports that there are many mounds in the vicinity of Oakley, Arkansas County, Arkansas.

Parish, Sidney.—Writes that near his house, 18 miles above Memphis, Tenn., is a large mound, upon which relics have been found.

Poynter, Robert H.—Writing from Desha County, Arkansas, speaks of Wal-ka-ma-tu-ba, an old Indian, who was buried in 1834, in the following manner: The house in which the family lived was built of round logs, covered with bark and daubed with mud. In the middle of the house a board was driven about 3 feet into the ground, and the old man was lashed to this with thongs, in a sitting posture, with his knees drawn up in front of his chin and his hands crossed and fastened under his knees. The body was then entirely encased in mud, built up like a round mound and smoothed over. A fire was kindled over the pile and the clay burnt to a crisp. Six months afterward the family were moved away and the mound opened. The body was well preserved. Another body had been wrapped in bark of the birch and deposited in the cavity of a dry spring.

Reed, J. W. K., makes the following remarks about Cross Creek, Pa.:

"In this vicinity are to be found many small mounds. On the top of a high ridge, partly on my farm, and partly on my neighbor's, are many traces of prehistoric races. At one point on the level, on top of the ridge, is a mound which was about 5½ feet high and from 2 to 3 rods in diameter, in which an excavation was made a few years ago, and a stone wall was uncovered. The wall was built alongside of a crack in a large rock; the crack is V shaped, which shows that one side has settled down; the mound is principally formed of stones, intermixed with some earth, and on it was growing large trees. There was nothing found in it except the stone-wall. It was only partially excavated. In the immediate vicinity are to be found other mounds, and several large rocks with a peculiar kind of *carving* on them. The carving is rather indistinct, but it is the work of human hands. Partly surrounding these carved rocks and mounds can be traced a circle formed by flat stones set in on edge. From a point in this circle starts a straight line of these stones that are set in on edge which runs near the center of the circle; this line can be traced 30 or 40 rods. In other places in this region, where there are large rocks, we find these carvings. The circular row of stones set on edge appear to follow around the top of the point of the hill. If the timber was cleared off this hill there would be a great view from it. At one point objects can be seen beyond the Ohio River (about 10 miles). Many stones about the mounds show marks of having been rudely dressed. We find many arrowheads, stone axes, stone hammers, &c., in this vicinity."

Richardson, A. S.—Calls attention to the existence of two mounds in the vicinity of West Point, King William County, Virginia.

Stubbs, Charles H.—In reply to the assertion made in Smithsonian Annual Report, 1879, page 446, that there are no mounds in Northeast Maryland, states that there are mounds or stone cairns in Cecil County, from one of which he obtained twenty pieces of pottery. There are no sculptured rocks in the Susquehanna River at Conowingo, but many in the river at Bald Friar, 1½ miles above Conowingo. Mr. Stubbs claims to have first brought these rocks to the notice of scientific men. Lancaster County was once the home of the Susquehannocks, the Shawanoes, and the Conestogoes, and wherever they lived are yet to be found relics of these tribes, and in all probability of a race far anterior to them. In the southern end of this county is the Rock Spring, excavated by the aborigines. On the Hutton farm is an Indian village site. In the Susquehanna, at Peach Bottom, Mount Johnson Island, is a famous locality for gathering stone relics. In Mastic Township are the evidences of another Indian village. In Manor, at what was once Indian Town, are yet to be found large quantities of pottery. Near Christiana and the Gap resided the Shawnees. Here is the quarry at which the steatite pots were made, one of which has not been severed from the rock. Mr. Stubbs cautions archæologists about committing themselves to names for aboriginal implements whose functions are still unknown.

Woods, E. H.—States that on the plantation of a friend close to the Roanoke River, near Avoca, N. C., is an old Indian camping-ground. During some excavations there were found bones, arrowheads, pottery, and a skeleton in a sitting posture.

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PAPERS RELATING TO ANTHROPOLOGY.

AUSTRALIAN GROUP RELATIONS.*

By A. W. Howitt, F. L. S., F. G. S.

I—INTRODUCTION.

There is probably no student of the development of civilized society who will be prepared to maintain that the social unit, during the long period over which history extends into the obscurity of the past, has been, as it is now, the individual. On the contrary, it will I think be readily admitted that the farther we go back the clearer it becomes that it was the group, and not the individual, which formed the basis of human society.

It seems strange that, although this principle of group relationship as the basis of social organization has been readily admitted as to peoples of the past, it should have been violently denied as existing among savages of the present day. The reason of this may be that the civilized man and the savage contemplate their social relations from two entirely different standpoints, though it might not be as difficult for the former to think after the manner of the latter as it is for the latter to fit himself mentally into the surroundings of the former. Training from childhood, with, perhaps, all hereditary tendency of thought, renders this next to impossible to the savage; but the civilized man has this advantage, that with largely developed mental powers he is able, where opportunity offers, and he cares to avail himself of it, to place himself on the standpoint of the uncivilized, and thus with more or less success to see the surroundings as the savage sees them, and to think of them with his thoughts.

This difficulty in projecting themselves, as it were, into the mind of the savage, has proved a stumbling block in the path of many anthropologists, who have studied the habits and beliefs of the lower races by means of the too often hasty and superficial statements of travellers, without having themselves any practical knowledge as to the modes of thought of the tribes in question; and thus they have not been in a position to question the accuracy of the statements made as to fact, or to draw the true inferences which the facts justified.*

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* Read before the Anthropological Society of Washington.

One of the strongest illustrations of the difficulty to which I have referred is shown by the determined refusal on the part of some English anthropologists to accept the classificatory system of relationship. The late lamented Dr. Morgan, who had practical acquaintance with the North American tribes, came to see that their peculiar system of relationship terms was founded on the idea of a group where civilized people have that of a single individual. He was thus led to institute inquiries which proved that this idea is common over the whole world in savage life, and he drew the general inference which might be drawn from the facts by persons accustomed to the mode of thought among the lower races. This, however, is so different from that of civilized man that most of the English anthropologists refused to accept his inferences and it is only now, when accumulated evidence continues to support his views, that the truth of the main generalizations which he made is beginning to be recognized.

In Australia observations may be made similar to those made by Dr. Morgan in America, but with this difference, that in the former country the native tribes are in a much lower ethnical stage, and are therefore so much nearer to the conditions under which the group system of relationship may be assumed to have arisen. In Australia, moreover, aboriginal society has had a continental development, free from disturbing influences from without. It affords therefore an unrivaled field for inquiry; and here, if anywhere in the wide world, it should be now possible to trace out some of the causes which have been at the root of the classificatory system of relationship.

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* The danger to which such inaccurate statements of custom lead when received as established facts justifying generalization is strikingly shown by the well-known and often quoted passage as to Australian marriage in Collins's English Colony in New South Wales, p. 362:

"These unfortunate victims (the wives) of lust and cruelty * * * are, it is believed, always selected from the women of a different tribe from that of the males (for they ought not to be dignified with the title of men), and with whom they are at enmity. * * * The poor wretch is stolen upon in the absence of her protectors. Being first stupefied with blows, inflicted with clubs or wooden swords, on the head back, and shoulders, every one of which is followed by a stream of blood, she is then dragged away through the woods by one arm, with a perseverance and violence that it might be supposed would displace it from its sockets." In this manner the woman is said to be dragged to the man's camp, where "a scene ensues too shocking to relate."

Isolated cases of brutal violence such as this doubtless occur as acts of war, but no such practice is known to me as a custom in any Australian tribe. On the contrary, Mr. C. Naseby, of Maitland, New South Wales, who lived for fifty years in the Kamilaroi country, states as follows:

"When a young man has passed a certain number of Boras (initiations) he has a right to choose a wife from among the unmarried and otherwise unappropriated women of the tribe who are of the class permitted to him by the native laws. He claims the girl in the presence of her parents by saying "I will come and take you by and by," and they cannot refuse her to him unless he be specially disqualified—as for instance if "his hands are stained with the blood of any of her kin." And even in that case he may carry her off by force if he can in spite of their refusal. For this purpose he generally comes by stealth and alone. But if he be a very bold warrior, he sometimes goes openly to the girls' camp and carries her off, defying the bravest of her friends to meet him in single combat if they dare to stay him."

This places the practice stated by Collins in a very different light.

In this memoir I propose to draw attention to the connection which I find to exist between certain group relations of the Australian aborigines. In the term "group relations" I include not only those which are indicated by the terms of relationship, but also those shown by the groups formed in the aboriginal communities by the action of those social laws which have divided them into what, for the sake of convenience, have been termed "class divisions." For the purposes of this memoir I shall rely for my evidence mainly upon the custom of certain tribes of Central Australia, whose condition is socially* the lowest of any with which I have acquaintance.

II.—THE TRIBAL STRUCTURE.

An Australian tribe may be defined as a larger or smaller aggregate of people, who occupy a certain tract of hunting and food ground in common, who speak the same language with dialectical differences,† who acknowledge a common relatedness to one another, and who deny this relatedness to all other surrounding tribes. This tribal aggregate may be so small as to cover a tract of country less than fifty square miles, with under a hundred individuals, or it may extend over hundreds of miles of country and number thousands of souls.

Such a tribe, as a whole, occupies a certain tract of hunting and food grounds, but it is invariably divided into well defined local groups, each having its own portion of the common country. These are again divided into smaller groups, until the smallest unit consists of a few people of the same blood, under the direction and guidance of the oldest or most able of the elder men.‡ Thus a tribe is composed of a number of local groups, and these are perpetuated in the same tracts by the sons, who hunt over the hunting grounds of their fathers. This has been termed by Mr. Fison and myself the "Local Organization."* But it is not the only organization of the tribe, for there is also what we have termed the "Social Organization," in which the tribe, as a community, is divided into two parts, which are quite distinct from the local groups just described.† Each of these two social divisions is, in many tribes, divided into two subgroups, and in all, except the most abnormal cases, there is a group of subdivisions to each class, or subclass, to which the convenient and well understood name of Totems may be applied.‡ These groups, subgroups, and totem groups have each a name, which is borne by every individual belonging to them. All the members of such a group are held to be parents and children, or brothers and sisters, as the relative ages of the individuals may determine. Thus we may distinguish between "own" and "tribal" parents, children, and brethren.

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* "Socially"—I use this term in a certain special sense—referring only to what I call the *socially* social organization. When I say that an Australian tribe is socially more advanced than others I do not mean that they have a better knowledge of the arts of life, but that their social organization is of a comparatively advanced type. And I take it that the line of advance is from group marriage to individual marriage, and from uterine descent to agnation.

I may note here that "individual marriage" does not necessarily imply monogamy. It is consistent with that form of polygamy under which a man may have more wives than one, he having an exclusive right to them, as against all the rest of his tribesmen.

† There are certain exceptions where, for instance, the husbands and wives are found to speak different languages, that is, different languages of the Australian stock, but this arises through the connubium between two tribes.

‡ In most tribes, if not in all, the old men constitute what may be called the Great Council of the tribe. For instance, in the Dieri, this council is composed of the heads of totems and of men of mark, such as warriors, counselors, orators, &c. The council has, among other functions, jurisdiction over breaches of tribal morality and offenses against the tribe. In short, it is the governing power.

I use the term "primary classes" for the two principal social divisions; but it is certain that, in many cases, their designations are "animal names," and therefore the term "major totems" might be applicable to them. The tribe, therefore, is organized in two ways. On the one hand, it is divided *geographically*, either into what may be termed hordes with uterine descent, or into clans with agnatic descent; and, on the other hand, it is divided *socially* into classes with their subdivisions as above described. The two organizations are coexistent, and they are coextensive in their entirety, but the divisions of the one do not correspond with those of the other. For, while all the people who belong to any given *local* group are found in one locality alone, those who belong to any given *social* group are to be found distributed among many, if not among all, of the local groups. In order that we may clearly perceive the bearing of the facts as to marriage, descent, and relationship, which I shall place on record in this paper, it is very necessary to bear in mind this distinction between the local and the social organization of a tribe.§

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* In order to avoid going over this ground, which would take up too much space, I may be permitted to refer to a memoir on this subject entitled, "From Mother-right to Father-right." Journal Anthropological Institute, August, 1882.

† Exceptions to this rule may be found in rare cases, where in certain advanced tribes the two organizations have come to be coincident; for instance, the Woiworung tribe of the Yarra River, in which the two totems of the community live in a number of local groups apart from each other. All the people in one locality are Eaglehawk, and in another they are Crow. It may be noted here once for all that the present tense is used in some cases where the past would be more appropriate, the tribes being all but extinct.

‡ Of course the word "totem" is, strictly speaking, the badge of a certain group. For the sake of convenience I use it also to denote the group which is distinguished by the badge.

§ This is a concise statement of what has been detailed more at length by Mr. Fison and myself in a paper entitled "The Deme and the Horde," communicated by us to the Anthropological Institute of Great Britain.

III.—THE CLASS ORGANIZATION.

In some communities there are only the two primary class-divisions, each with its group of totems. In others there are the two primary classes, each divided into a pair of sub-classes, and each of these pairs has a group of totems. In some cases this totem group is common to both of the two sub-classes to which it belongs; in other cases each sub-class has its own peculiar totems. In some exceptional cases the primary classes are wanting. In others the usual totem sub-groups are absent, but the primary classes, or their sub-classes, are themselves totems. Other exceptions are where the totems alone, or the classes alone, have survived. All these abnormal instances I have found to be connected with changes in the line of descent. The primitive and complete forms have uterine descent; and it is in cases where descent is counted through the male line that I find the most abnormal forms to occur. There are also intermediate cases. The changes in the class system, their variations, and their decay are therefore connected with the principle of agnation. To this subject I shall again refer. The decay in the class system of a tribe is, in fact, a symptom of profound changes in its social organization; and these changes, so far as I know, are invariably connected with the more pronounced influence of the local groups. The local organization becomes stronger as the social organization grows weaker.

The entire subject of the class organization, and the development of the class divisions and totems, is too large to be entered upon here; and for some further particulars concerning them I must refer to a brief memoir of mine, entitled Notes on the Australian Class Systems, which may be found in the Journal of the Anthropological Institute of Great Britain, for May, 1883. In order, however, to bring the class organization clearly into view, I subjoin that of the Dieri tribe of Central Australia, which will serve as the type of the less developed systems, and also as an illustration of the remarks I am about to make in this paper on the connection existing between the class groups and those indicated by the terms of relationship now in use.

Much of the evidence I am about to use will be taken from the customs of the Dieri and other kindred tribes, which, collectively, form a great allied group or "nation."* The letters and numerals, which are prefixed to the class divisions and totems in the following table, will serve for convenient reference.

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* Independently of my own acquaintance with the Dieri and the allied tribes more than twenty years ago in their wild state, I am indebted to Mr. S. Gason for very full particulars as to the Dieri, in whose country he resided for six years as an officer of the South Australian mounted police, and of whose community he became an initiated member. As to the Kūnándabūri tribe, to which I refer, I have unfortunately much less information. For what I have, I am indebted to Mr. J. W. O'Donnell, formerly of Mount Howitt station, in that country.

TABLE I.—*Dieri class system.*

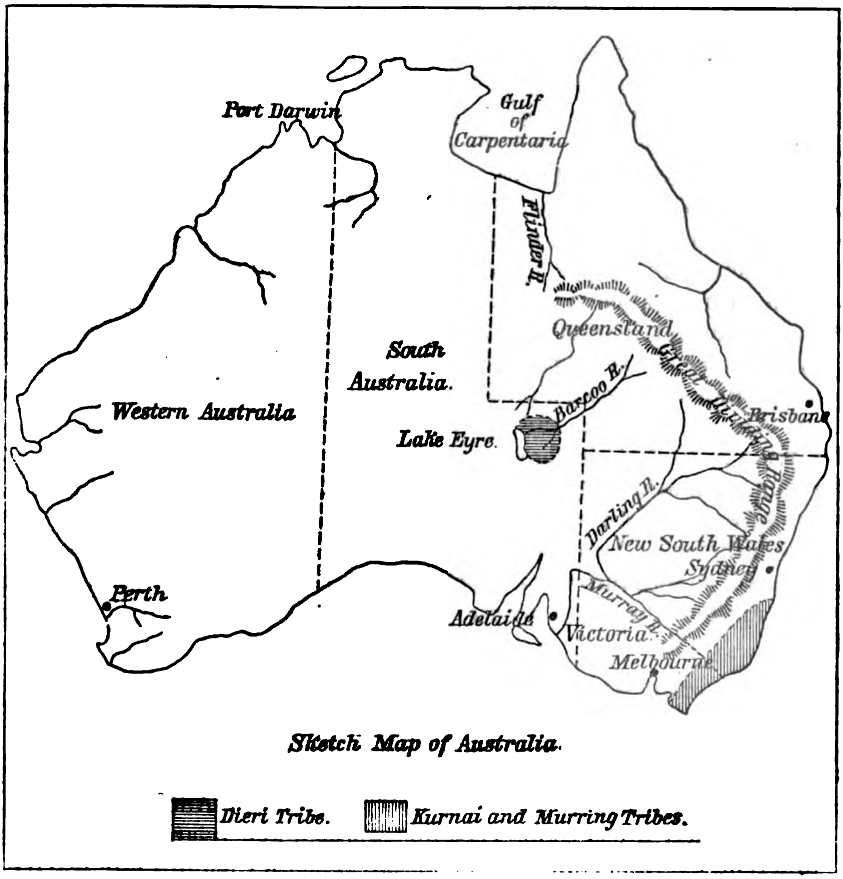
Primary divisions.	Totems.
A. Máttĕri	1. Karaura = eaglehawk. 2. Warūgati = emu. 3. Kíntălă = native dog and thirteen other totems.
B. Kārărū	1. Tchūkŭrū = kangaroo. 2. Kauálka = crow. 3. Tidnamára = frog and sixteen other totems.

Every member of the community is either Matteri or Kararu. Each individual also bears one of the totemic names of the primary division to which he or she belongs.

This class system represents that of the Dieri, the Kunandaburi, and other kindred tribes, between whom there exists connubium. It also represents the systems which are found under various dialectic differences of nomenclature among tribes spread over a very large area in Central Australia. The members of one tribe know well which of their own divisions are the equivalents of those in neighboring tribes, even when the totemic names are not the same.

Before explaining the laws of these classes it will be well to say a few words about the Dieri and the kindred tribes making up the "nation" of which it is the most important member.

As shown upon the annexed sketch-map, the Barcoo River, in its numerous sources, the Alice, the Thomson, and many other streams, rises on the western fall of the Queensland Great Dividing Range, and thence has a general south-easterly course into the depressed region of Central Australia. Soon after passing from Queensland into the colony of South Australia it begins to form a large delta, or a series of deltas, and its numerous branches water, and often partly submerge, a tract of country at least 20,000 square miles in extent. The various streams of this delta terminate in lakes, of which Lake Eyre is the largest. This delta country of the Barcoo—or, as it is called locally, Cooper's Creek—is one of the hottest and driest districts in all Australia—a country of sand-hills, of mud-plains subject to floods, of stony tracts, and of salt lakes. It is subject to great vicissitudes of climate, being in its extreme conditions a perfect garden of verdure after seasons of flood, while during long continued droughts it is little better than "a howling wilderness." This delta country on the eastern side of Lake Eyre is inhabited by the Dieri tribe. To the north, east, and south, and to the west also beyond the great lake—are other tribes allied to the Dieri by language, by custom, and by class system, all more or less intermarrying. Of these the Kunandaburi tribe is one of the farthest outlying to the eastward within the Queensland boundary on the main Barcoo River above the point at which the delta commences. Of all these tribes, as I have already said, the Dieri is the central and most important. Not only do its members consider themselves as being "the fathers of all the tribes,"* but these on their part regard the Dieri with mingled feelings of respect and fear.



Sketch Map of Australia.

The Dieri tribe may represent all the others. It is divided geographically into three sections, each of which takes the name of its principal locality, and these sections are again locally divided. Its social organization is based upon the division of the community into two classes, each with its group of totems.† Each totem is under the direction of a headman, who is the oldest of the name. Each man is what I may term the "totemic brother" of every other man and woman of his totem on the same level with him in his generation. An illustration will show how this works. When, for instance, a stranger arrives at a Dieri encampment from some neighboring tribe, the first question put to him is,

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[*] Quoted from information supplied to me by Mr. S. Gason.

[†] The Dieri word for totem is Mŭrdū. This word has two meanings, one signifying "taste," the other "totem"; that is to say, one of those names of animals, birds, reptiles, fish, insects, or plants, which, according to the Dieri legend, the Great Spirit Mūramūra ordered the ancestors to assume when he instituted their class divisions.

"What is your totem?"* This being ascertained, his totemic brethren take charge of him, protect him, and treat him with hospitality, even to the extent of providing him with a temporary wife of that totem with which his own intermarries.

These totems are strictly exogamous under the severe penalty of death. Thus, a man being A 1 (that is, Matteri and Eaglehawk; see Table I), may marry, according to the Dieri rule, a B woman of any of the B totemic divisions, and so on with A 2, A 3, &c., and *vice versa*, always provided that the parties do not stand to one another within certain close degrees to be hereinafter specified. Even casual amours between persons who are forbidden to each other, either by this nearness of actual kinship or by identity of class and totem, are regarded with the utmost abhorrence and are punished by death. Yet this rule differs somewhat in different tribes, for, among the Kunandaburi, the prohibition is relaxed upon a woman's marriage, when the *jus primæ noctis* includes all the men present at the camp without regard to class or kin.† Among the Dieri the rule is never relaxed on any occasion, and this tribe is, as I shall show, in some respects slightly in advance of the Kunandaburi, while both stand at the commencement of the long progressive series formed by all the Australian tribes concerning which I have hitherto collected data. At the other end of this series stand tribes such as the Kurnai, of Gippsland, whose class system has become almost extinguished, and whose local divisions have become agnatic clans.

IV.—THE RELATIONSHIP TERMS.—MARITAL GROUPS.

The terms denoting relationship which are used by the Australian tribes belong to the classificatory system of Dr. Morgan. After collecting and studying a great number from all parts of Australia, I have found that there are several types under which the relationship terms of different tribes may be arranged; and that they show a progressive change from a system of extreme simplicity to one, which, although still classificatory, has developed far more individual distinctions than our own descriptive system.

Looked at as a whole, these types show a progressive development, which is certainly connected with a progressive social change, indicated in most cases by the change in the line of descent. What I now propose is, not to enter upon a general discussion of the Australian relationship terms, but to point out the connection between them and the class systems which I have described in the preceding pages. It will suffice for my purpose to show that the terms of relationship arise naturally out of the relations of the class divisions to each other, and that these relations are those of group to group.

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* This question, "Minna murdu?" can be put by means of gesture language, to which in the same way a suitable reply can be made. Thus it is possible to learn, at a safe distance, whether a stranger is friend or enemy, even more certainly than by using the well understood sign for "peace."

† This extreme and exceptional extension of the *jus primæ noctis* is given on the sole authority of Mr. J. W. O'Donnell, who resided for some years in the Kunandaburi country. I have not been able to obtain any further information on the matter.

I find that the relationship terms of the Australian tribes fall into certain natural groups, of which I select three of the principal for illustration. These are the *marital*, the *parental and filial*, and the *fraternal;* and I take those of the Kunandaburi and the Dieri tribes for illustration.

TABLE II.

English.	Kunandaburi.	Dieri.
1. Accessory husband	Dilpa mali	Piraūrū.
2. Individual husband	Nūbaia	Nōa.
3. Husband's brother	Nubaia kodimali	Noa.
4. Sister's husband (F)	Nubaia kodimali	Noa.
5. Accessory wife	Dilpa mali	Pirauru.
6. Individual wife	Nubaia	Noa.
7. Wife's sister	Nubaia kodimali	Noa.
8. Brother's wife (M)	Nubaia kodimali	Noa.

(M) means male speaking; (F), female speaking.

The first terms in these lists challenge attention. In all these tribes there are two kinds of connections, which we may term marriage. One where two individuals are allotted to each other permanently, often in extreme youth, by their parents. The other where a man and a woman are allotted to each other as "accessory spouses," each of whom may stand in the same relation to other individuals of the opposite sex.

The exact nature of this second kind of marriage I shall now consider; and I take the Dieri instance for illustration. The relation is called Pirauru,* and the various Piraurus are allotted to each other by the great council of the tribe in secret session, after which their names are formally announced to the assembled people on the evening of the ceremony of circumcision, during which there is for a time a general license permitted between all those who have been thus allotted to each other.

The following précis of Mr. Gason's valuable information shows the precise nature of this Pirauru relation:

1. Each Dieri man, or woman, is the Pirauru of some other Dieri woman, or man.

2. The relation of Pirauru may exist between men and women of different local groups, or of different tribes.

3. The relation of Pirauru may not exist between a person and those who stand to him or her in any one of the following relations: Father, father's brother, father's sister, mother, mother's sister, mother's brother,

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* The only derivation I can give for this word is from Pira=moon—also used for the round wooden bowls made by the Dieri—and ūrū=circular. The great councils of the tribe are always held at full moon, and Pirauru may possibly be taken as having relation to the time when these couples are allotted to one another. I however offer this explanation with some diffidence.

brother's child, sister's child, brother, sister, or any of those whom we ourselves call "cousins," either on the father's or on the mother's side.

4. Nor may it exist between persons of the same totem, for these are regarded as brother and sister, or (the Dieri having uterine descent) mother and son, as the case may be.

5. A Dieri man, having passed through the Míndraí (peace) ceremony, may have a Piranru allotted to him.*

6. The Piraurus being allotted to one another at each great council previous to the ceremony of circumcision, a man, or a woman, being already Pirauru, may thus acquire a new Pirauru relation in addition to those previously acquired. Hence in time any individual may come to have several Pirauru.

7. Seniority in the man regulates the temporary right to any given Pirauru. Thus, supposing an older man and a younger to be in camp together, and that the latter had with him a Pirauru, the former, being alone, the older man could lawfully claim the woman, if she were Pirauru to him also.

As the Piraurus cannot be of the same class name we have here a number of men belonging to one class married collectively to a number of women of the other class. Thus a number of A men (see Table I) are the Piraurus of a number of B women and *vice versa;* and this is clearly a form of group marriage, which, when the two classes meet at the tribal ceremonies, becomes what may be called regulated communal intercourse between the sexes. At other times, when the community is scattered over the tribal country, a man may be found having with him at one time one or more Pirauru, and at another time other women who stand in this relation to him; or a woman may be found living with several men who are Pirauru to her. To those unacquainted with the custom this presents the aspect of lawless license, or of polygamy, or of polyandry, but it is in fact group marriage.†

The terms Dilpa mali‡ and Pirauru signify the same relation, the one among the Kunandaburi and the other among the Dieri. They are the terms of relation between two groups, and these two groups in the widest sense are the class divisions A and B (Table I). Here, then, in a modified form, and in actual existence, is what I have elsewhere called the Divided Commune.*

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* Before being fully admitted into membership in the community a youth must pass through the following ceremonies: 1. Chirinchiri—knocking out two front teeth. 2. Kurawali wonkana—circumcision of boys. 3. Wilyaru—anointing with the blood of an old man. 4. Mindari—the peace ceremony, when the entire community assembles.

There is also an additional rite to which only certain individuals, selected by the old men, are subjected. This is *Kūlpi*, the slitting of the urethra.

† The Pirauru custom clearly accounts for the so-called polyandry of the Nairs. (See Mr. J. F. McLennan's Studies in Ancient History, p. 148.)

‡ The term Dilpa mali I cannot explain. I am told that the word kodimali means "nothing," in the sense of negation of something of which Nubaia is the expression.

Besides this form of group marriage there is also individual marriage in the tribes. This is the Noa relation, the features of which can be thus summarized.

1. The relation of Noa can only exist between a man and a woman of different class names and totems, who, moreover, are not within certain prohibited degrees of relationship to each other.

2. A woman becomes the Noa of a man most frequently by being betrothed to him when she is a mere infant, he being perhaps a young man. In certain cases she is given by direction of the great council as a reward for some meritorious act on his part.

3. A man may be Noa to two or more women, but a woman cannot be Noa to more than one man.

4. But a woman who is Noa to one man may also be Pirauru to several other men.

5. The right of the Noa overrides that of the Pirauru. Thus a man cannot claim a woman who is Pirauru to him when her Noa is present in the camp, excepting by his consent. It is not often, however, that the male Noa refuses to accommodate the Pirauru temporarily, for he is liable to have a refusal retorted upon himself. But he will more freely lend his Pirauru than his Noa. Such cases, however, are the frequent causes of jealousies and fights.

6. When a man is sent on a mission to another tribe he never takes his Noa with him. It is understood that, on such occasions the female companions of these "ambassadors" are to be perfectly complaisant to all the men of the visited tribe who do not stand to them within the prohibited degrees; and it is held that for this purpose a man's Pirauru is better fitted than his Noa. Yet this Pirauru is of course the Noa of some man who remains at home.

7. The relationship of Noa may exist between individuals of any of the allied tribes, always provided that there is no obstacle of class or other prohibition. Such arrangements between individuals of different tribes are often, perhaps most frequently, brought about by the great council, as tribal alliances, and are the subject of much diplomatic negotiation.

The Noa of the Dieri is the same as the Nubaia of the Kunandaburi. But the marital group of the latter has a most archaic simplicity, showing a group relationship even more extended in theory than that which the Pirauru of the Dieri gives in actual practice. This, however, is in accord with the general customs of the Kunandaburi, who are the least advanced of all the tribes known to me. While, with the Dieri, the sexual intercourse of persons who, according to their notions, are too nearly related is forbidden under all circumstances by a death penalty; with the Kunandaburi, there is, according to Mr. O'Donnell, no such restriction on the occasion of the marriage of a betrothed girl. This gentleman also says that, though it is considered improper that there should be intercourse between women and their husbands' own brothers, or between men and their wives' actual sisters, such intercourse constantly takes place with little more than a mere pretense of concealment.* The Dieri would regard this as abominable—at least, if the Noa were present in the camp—and yet the third, fourth, seventh, and eighth relationship terms (Table II) show that, in all probability, it was once their practice, as it still is, in at least one of the tribes composing the group to which they belong.

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* See Kamilaroi and Kurnai, passim. I may take this opportunity of saying that I doubt whether, even under an "Undivided Commune" there could have been anything more than a limited promiscuity, excepting when the whole community occasionally reunited. The general conditions of savage life on the Australian continent would not permit an entire undivided commune to remain united for any length of time in the same locality. The Dieri practice may show us, in a modified form, what might take place. The common Pirauru right exists, but it cannot be fully exercised excepting when the whole tribe assembles. Then, and then only, does the Pirauru group of A men (or the Pirauru group of B men), with its female Pirauru, temporarily resemble what one might suppose an undivided commune to be.

In tribes such as those with which I have been dealing, the terms of relationship fit in more or less completely with the actual group relations of the class divisions and their members. The inference to be drawn theoretically from an inspection of the terms is that a group of tribal brothers have their wives in common, and that a group of tribal sisters have their husbands in common. When this is compared with the actual custom now prevalent among the tribes inhabiting the Barcoo delta, it is found, as I have already stated, that the contemporary generation† of each class division is composed of "brothers and sisters"; that the men of one class, who are thus "brothers" to one another, marry the women of the other class, who are thus "sisters" to one another; that at all times there is between the intermarrying groups a modified communal right, which becomes general among those who have been allotted to each other as Pirauru; and that the marital rights, which are inherited in common under the laws of the social organization, are controlled and restricted by the local organization through the great council of the tribe.

It now remains to be seen how far these conclusions are borne out by an examination of tribes in other parts of the Australian continent.

Of all the tribes which I have hitherto met with the least advanced socially (that is, as to their social organization) are those of Central

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*Mr. Fison tells me that this was the case in some, at least, of the Fijian tribes. And, after this memoir was completed, information reached me from Mr. S. Gason that "the law allows intercourse" between these parties, but only in the absence of the Noa.

†The word "generation" is of uncertain meaning, and its use may be misleading. I do not use it as implying a line of ascendants and descendants. Nor do I use it in the common acceptation as "the present generation," which includes all those now living, as distinguished from those who are gone, and from those who are yet to come. Perhaps the best among several unsatisfactory definitions which suggest themselves is that I mean by it "all those on the same level in a generation." Thus, all the young people who are marriageable would be on the same level in the generation to which they belong.

Australia; the most advanced are those which are found along the southeastern coast-line. These can be taken as the two extremes of a series in which all the tribes I have examined can be arranged according to their social status. I am not prepared to show all the causes which have advanced the coast tribes far beyond those in the center of the continent, but this much may be ventured upon, that the social advance appears to be connected with a more favored climate, and the greater abundance and regularity of food-supply consequent thereupon.

The tribes which I have already described have a marked social organization with uterine descent. In the tribes with which I am about to deal the social organization has been profoundly modified, and in some cases even extinguished all but the faintest traces; while, in an equal degree, the local organization has gained strength, and taken to itself all the powers which the social organization formerly possessed. For comparison, I take the Kurnai and the Coast Murring tribes, which stand near the end of the series, at whose other extremity are the Dieri and Kunandaburi.

The Kurnia tribe inhabit Gippsland and the Coast Murring the country extending from the confines of Gippsland along the southeastern coast towards Sydney. For the purposes of this memoir the Shoalhaven River may be taken as their approximate limit in that direction. The two tribes touch at Mallagoota Inlet, where their extreme local sections intermarry.*

The Kurnai tribe is divided into five large clans,† which again are divided into local subdivisions, until the smallest group consists of only a few members. Of class divisions the Kurnai have none, and the only remaining traces of totems are two birds, the name of one of which is borne by all the males and that of the other by all the females of the tribe. Traces of the two great class divisions of the stock from which the Kurnai are probably derived—the classes Eaglehawk (Būnjil) and Crow (Waa, or Ngarūgal)—are found in the application of Būnjil to all the old men of the tribe, and in the extreme reverence felt for the crow. The Kurnai believe that it can talk their language, and that it is in the habit of warning them of approaching danger. In this tribe the class organization, so far as it affects marriage, is extinct. The local organization, however, has stepped into the place thus left vacant. It has assumed authority over marriage, and it regards all those who were born in the same locality as necessarily so near in blood as to be forbidden to each other in marriage. A man therefore is compelled by this rule to seek a wife in some more distant part of the tribal territory, and from certain local groups, to the exclusion of others. Moreover, in this tribe the remarkable custom of marriage by elopement has become developed to such an extent that only under exceptional circumstances can a man obtain a wife in any other manner.

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*For further details as to the remarkable organization and customs of this tribe, see "Kamilaroi and Kurnai," Robertson, Melbourne.

†I use the word "clan" advisedly here, because this tribe has agnatic descent. The term "horde" I use for local divisions of tribes having uterine descent.

In this tribe marriage is individual, as in the Noa practice of the Dieri; but men are never known to lend their wives to others,* nor does anything like the Piraurn custom obtain. Nevertheless, there are certain occasions when a practice arises similar to that of the Dieri, but under the restrictions placed on the union of the sexes by *locality* and not by *class*. In the case of marriage by elopement, the woman becomes for one day, under the *jus primæ noctis*,† the common property of the bridegroom's "comrades." The faithless wife also becomes the common property of the men who pursue her, until she is taken from them by her husband or her brothers. On occasions such as the appearance of the Aurora Australis, the supposed impending danger to the tribe is believed to be averted by a temporary exchange of wives by order of the old men.

The coast Murring consists of several tribes, or rather, large clans, which have local names, but to which collectively the name of Murring (=men) is applied. These clans are again divided and subdivided down to the smallest groups of a few individuals, each under the direction of its oldest man. The large groups are governed by old men, who combine the attributes of age and of powerful "magic," and the oldest and most powerful wizard is the master (Bīamban) of them all.‡

In the Murring tribes the class system is not completely extinct. There are not the two primary classes, but there are numerous totems. These descend, not from mother to child, as in tribes having uterine descent, but from father to child, and in some localities they are borne in duplicate. They are scarcely regarded as names, but still they have a power over marriage, for no man may marry a woman of his own budjan (totem). The principal control over marriage is, however, in the local organization; for the rule is very strict that no man may marry in his own locality. He must obtain a wife from certain fixed localities at a distance from his own. In these tribes wives are obtained by the exchange of sisters—own or tribal—under the arrangement of the respective fathers. The only occurrence of any of the primitive forms of license with which I am acquainted, is when a visitor from a distance is provided with a temporary wife by the hosts. Also, in cases of elopement, when the woman is captured, she becomes for a time the common property of her pursuers. With these exceptions, marriage seems to be strictly individual.

I now give, in a tabulated form, the terms applicable to the marital group as used by the two tribes under consideration, for comparison with the Dieri and Kunandaburi terms given in Table II.

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* This applies, of course, to purely native custom as it prevailed before the incoming of the white men. The mere immorality resulting from the contact of the two races is not taken into account.

† "Comrades" (Brogan.) See a paper on the Kurnai Jeraeil, communicated by me to the Anthropological Institute of Great Britain.

‡ This "master" must not be taken as the equivalent of the "hereditary chief," found in more advanced tribes, such as the Fijians, &c.

TABLE III.*

English.	Kurnai.	Murring.
1. Accessory husband		
2. Husband	Bra	Tanamă.
3. Husband's brother	Bra	Nájandŭri.
4. Sister's husband (F)	Bra	Najanduri.
5. Accessory wife		
6. Wife	Maian	Tanama.
7. Wife's sister	Maian	Najanduri.
8. Brother's wife (M)	Maian	Najanduri.

(F) means female speaking; (M) male speaking.

* The Kurnai terms are one of the two dialects spoken by that tribe. It is called Mŭkthang. Muk = true, superior, eminent; Thang = speech. Mukthang therefore is the language par excellence. The Murring terms are in the language called Tharawal, which is spoken by the coast Murring tribes adjoining the Kurnai. It is unintelligible to the Kurnai, as their speech also is to the Murring; and yet the border clans of the one tribe intermarry with those of the other. Here we find an easy explanation of the fact that among savages husband and wife sometimes speak different languages.

An examination of these terms shows, in those of the Krnai, an archaic simplicity which I can only account for on the supposition that they owe their preservation to the extreme isolation of the tribe, arising from the geographical features of their country, which render it extremely difficult of access. No distinction is drawn between the husband, his brother, and the wife's sister's husband. These terms do not fit the existing relations as marked by individual marriage, the exclusive right of the husband to his wife, the absence of the Piaruru practice, and the male line of descent. But they more clearly accord with the relations which arise on exceptional occasions such as those I have mentioned. The custom on these occasions is analagous to that of the Pirauru, and to this practice the relationship terms of the Kurnai apply, and indicate a possibility of its former prevalence as a custom.

In the Murring terms a distinction appears between the second and the third and fourth, as well as between the sixth and the seventh and eighth, indicative of individual marriage.

V.—THE PARENTAL AND FILIAL GROUPS.

I now return to the Dieri and Kunandaburi tribes for illustrations of these groups, which I take together as follows:

TABLE IV.

English.	Kunandaburi.	Dieri
1. Mother's Pirauru		apiri waka.*
2. Father	urninu	apiri, or apini.†
3. Father's brother	kauali	apiri waka.
4. Mother's sister's husband		apiri waka.
5. Father's Pirauru		andri waka.
6. Mother	amundi	andri wandrini.
7. Mother's sister		andri waka.
8. Father's brother's wife		andri waka.
9. Son of Pirauru (M)		atamŭra waka.
10. Son of Noa (M)	karaga	atamura, or atamurini.
11. Brother's son (M)		atamura waka.
12. Wife's sister's son (M)		atamura waka.
13. Son of Pirauru (F)		atani waka.
14. Son (F)	worua	atani.
15. Sister's son (F)	worua	atani waka.
16. Husband's brother's son (F)		adada.

(M) means male speaking; (F) female speaking.

* Waka = little.

† Apini, according to Mr. Gason, means "my father" as "signifying a relation without doubt." It is evidently an abbreviation of apiri = father, and ani = I. A little difference exists between Mr. Gason's method of spelling the native words and my own. I have followed as nearly as possible the pronunciation which I remember to have heard from the natives themselves when I was in their country.

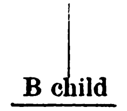
I regret that the Kunandaburi list is so meager, but unfortunately my source of information ran dry before my inquiries could be completed. There are, however, enough taken together with the previously given marital relations, to suggest a similarity to those of the Dieri. The third term, if further inquiry shows it to be correct, is a deviation.

The custom of Pirauru must necessarily produce doubt as to the paternity of children. A Dieri woman rarely admits that any particular man is the father of her child.* I have shown that it is the group of A men who cohabit with the group of B women (Table I) and *vice versa*, and that the whole group of women to which the mother of any given child belongs are also regarded as its mothers. But a distinction is drawn between the mother's Pirauru and her Noa. With the latter she habitually cohabits. She was specially given to him by her father, or by order of the great council. Hence he claims the right to dispose of her daughter in marriage, and her children call him Apiri=father, or Apini=father-to me, while they call her Pirauru Apiri waka, that is to say, "little father." Here we can see the commencement of individual marriage, and of the more precise notions of descent which follow it.

The man's Piraurus are called the mothers of all the children of his Noa; that is, of all the children of the woman with whom he habitually cohabits. But they are the andri waka, that is to say, the "little mother" of those children, while each child's own mother is its andri=mother, or andrini=my mother.

Hence a man is the "own" father of all the children of his Noa, but the "little father" of the children of his Piraurus. It follows that if every woman is Noa, every child must have some Apini, *i. e.*, some "particular father," and *patria potestas* can begin.

Given the cohabitation of a group of A men with a group of B women, as I have shown it to exist, the men being "own" or "tribal brothers," it follows naturally that each one is the father in common of all the children. This we see expressed in the classificatory terms tabulated by me (Table IV). The "father's sister's husband" is not included in this group of fathers. He is kaka, not apiri. The reason of this will appear from the following diagram.†



The diagram shows why the father, father's brother, and mother's sister's husband are all "apiri," for they are of the same group, (M) A, which is Piraurn to group (M) B. The mother's brother and the father's sister's husband—who are the same group individual—are both Kaka, and form part of another martial group, (M) B.

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* Informant, Mr. S. Gason.

† Explanation of diagram.—A and B are the two intermarrying groups. (M) A and (M) A′ are brothers, (F) A is their sister. (F) B and (F) B′ are the wives of (M) A and (M) A′. (M) B it the husband of (F) A. B is the child of (M) A and (F) B. (M)=male; (F)=female.

I have said that in spite of the Pirauru system, and the consequent uncertainty as to actual paternity, there is, nevertheless, a tendency to attribute the paternity to the man who habitually cohabits with the mother of the child; that is to say, who is to her in the relation of Noa, which, indeed, is inchoate individual marriage. He is the "father" of the child, while the mother's accessory husband is only the "little father." Morever, he claims the right to dispose of the daughter of his Noa in marriage, though she may be *de facto* the child of any one of her mother's Piraurus.

This rests upon a belief which is not peculiar to the Dieri. I have found it in every Australian tribe, without exception, with which I have acquaintance. This belief is that the child is derived from the male parent only, and that the mother is no more than its nurse. As a black fellow once put it to me, "The man gives the child to a woman to take care of for him, and he can do whatever he likes with his own child." This is so wonderfully like Apollo's well-known dictum in the Eumenides as to be positively startling when heard from the lips of an Australian black; but the foregoing is not the only instance within my knowledge in which the belief has been expressed by the aborigines. The subject well merits full discussion, but, as it involves the important question of the change of descent from the female line to that through males, I defer its further consideration to the penultimate section of this memoir.

I now offer for comparison with the parental and filial terms of relationship among the Dieri and Kunandaburi, those of tribes who are socially more advanced.

TABLE V.

English.	Kurnai.	Murring.
1. Father	mungan	banga
2. Father's brother	mungan	nadjung
3. Mother's sister's husband	mungan	kauang
4. Mother	yukan	minga
5. Mother's sister	yukan	minung
6. Father's brother's wife	yukan	minung
7. Son (M)	lit	wurun
8. Brother's son (M)	lit	wurun
9. Wife's sister's son	lit	wurun
10. Son (F)	lit	wurun
11. Sister's son (F)	lit	wurun
12. Husband's brother's son	lit	wurun

(M) means male speaking; (F) means female speaking.

I have found the study of the development of the terms of relationship used by the Australian aborigines to be one of extreme difficulty. When arranged in groups, as I have arranged them, the terms of one group do not logically follow out those of the antecedent group, as do the terms used by savage and barbaric tribes in other parts of the world collected and arranged by Dr. Morgan in his magnificent work on systems of consanguinity and affinity. For instance, it is rare to find that the terms of the filial group follow logically those of the parental group. As a general rule, the latter has departed farthest from simplicity. The Murring list is a case in point. (See table.) Nor have I found that the actual social status of any Australian tribe in the present day can be inferred from an examination of the terms of relationship alone. In all cases it is evident that the actual status of the tribe is in advance of the status theoretically deducible from the terms of relationship. This is significant and points to social development. The most extreme case within my knowledge is that of the Kurnai; and I have selected it partly for this reason, and partly because I am better acquainted with the customs of this tribe than with those of any other. It is a good example of the preservation of an archaic type under changed conditions.

In the Kurnai terms we have precisely the analogues of the Dieri; but, as I have already pointed out, the Kurnai have no Pirauru practice, and indeed would look upon such a custom with horror. Nevertheless, as I have said, they did on occasions permit a license which to my mind strongly points to its former existence with them as a custom. Moreover, the terms given for the parental group point to such a form of group marriage, and those for the filial group strengthen this inference.

The Murring, in their tribal organization, their individual marriage with a strong obligation of fidelity on the part of the wife, and their agnatic descent, much resemble the Kurnai; in fact, both these tribes may be said to stand nearly upon the same social level, but the former has relationship terms considerably more differentiated than those of the latter. Yet in these the filial group still retains the extreme simplicity found in the relations of tribes who have group marriage still actually existing, the only difference being that the Murring terms for "father's brother" and "mother's sister's husband" are differentiated from that for "father," as also are the terms for "mother's sister" and "father's brother's wife" from that for "mother."

In both the Kurnai and the Murring tribes, however, there is a distinction made between the terms of the parental group which is worth noting as indicating severally two processes of differentiation. While the Murring have separate terms to distinguish the father, the father's brother, and the mother's sister's husband, who, under the Pirauru practice of the Dieri, may all be married in the group to the same woman, the Kurnai make no distinction between these terms excepting by adding the word "brebba" to the term implying paternity. The "own father" is Mungan, while the father's brother and the mother's sister's husband are Brebba mungan; that is to say, "the other father." This distinction, however, is rarely used in ordinary parlance, though it comes out when particular inquiry is made as to the relationship.

VI.—THE FRATERNAL RELATIONS.

The class divisions, viewed in their Pirauru relation, produce two marital groups, and, as a necessary consequence, they also produce parental and filial groups. The Pirauru relation also creates, as a matter of course, a group relation between the children of the Piraurus. It ought to be found, and it is found, that the children of the Pirauru group recognize one another as brothers and sisters. Moreover, all the children of any given Noa are brothers and sisters of the Pirauru group to which that Noa belongs. But when, in any particular part of that group, a man habitually cohabits with his Noa and with a Pirauru, and the children of the two women are brought up together, Mr. Gason tells me that there is a recognition in this family of a superiority in the children of the former over those of the latter. This fact is of the very greatest importance, for it brings us to the dawning of birthright.

The fraternal group, as shown in the class divisions, embraces all those on the same level in a generation who are of the same class name, but more especially all those who are of the same totem, which is nearer to the individual than is the class. The "totems-men" succor one another as a matter of course in all tribes in which, as in the Dieri, the social organization is vigorous. Where, however, it has been superseded by the social organization, as among the Kurnai, it is the members of the local group who aid each other, and this bond is strengthened by the far-reaching relationships in this tribe, such, for instance, as that of "brother" In all these cases the individual recognizes and carries out the obligation laid upon him by the group of which he is a member.

As it seems to me, the division of the community into two primary classes and lesser divisions has evidently been brought about with intention* to prevent those connections between brother and sister, and other near relations, which are looked upon by the blacks with the utmost abhorrence. The prohibition extends beyond the children of the same parents, and prevents the union of those who are of the same class name or totem. The group relations which, as I have shown, spring naturally out of the class divisions and their laws, also forbid the marriage of all who are within the fraternal relations. But in the less advanced tribes I have met with an instance where the prohibition is not a perpetual injunction never, under any circumstances, to be broken. In the Kunandaburi tribe the prohibition is relaxed on the occasion of a girl's marriage, when, according to Mr. O'Donnell, her favors may be shared "by all the males present in the camp without regard to relationship." In the Dieri tribe, however, the prohibition, as regards intercourse between those who are within the fraternal relations, is never relaxed. No greater offense can be offered to a Dieri man or woman than to call him or her "Būyūlū párchana," which means, according to Mr. Gason, "nearest relatives," or, in its understood sense, "incestuous intercourse between near relatives." Among such are all those who stand in the fraternal group relation to one another.* That this group relation is a real one to the Dieri is proved by the fact that such an offense is punished by the great council of the tribe with death.

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* This is opposed to the commonly-received notion that the lower savages are mentally incapable of perceiving and dealing with such questions. But the fact is beyond dispute that they do perceive them, and discuss them freely among themselves, the women taking an active part in the discussion.

In the more advanced tribes, where the social organization has given way and is more or less approaching extinction, if not utterly extinct, the fraternal group survives as long as a single totem remains in existence, as in the coast Murring. And, where the totems are gone, it becomes transferred in a modified form to the local group, whose members are then thought to be so "near to each other" in blood as to be forbidden in marriage. It is well to remember that this local group has, in all cases, even where uterine descent is strongest, been perpetuated in the same place from father to son by occupation, I may almost say by inheritance, of the hunting grounds.

The relationship terms of different Australian tribes, which I have collected and tabulated, show three types of the fraternal group.

First. All the descendants of several brothers or of several sisters are still brothers and sisters mutually; and this relationship descends in an ever-expanding fraternal group. Such an instance is that of the Kurnai tribe.

Second. The descendants of several brothers are differentiated from the descendants of several sisters; so that two fraternal groups come into existence, each of which is still fraternal within its own limits, but is not so towards the other group. Nevertheless, the prohibition as to marriage between the members of the two groups still obtains. The new relation thus arising, finds expression in a reciprocal term such as the "Kami" of the Dieri (Table VI). Taken in the widest sense, the contemporary generation "on the same level" in the intermarrying divisions A and B (Table I) may be said to be "potential spouses" to one another; but the marital privilege is restricted by what we may call an "inner regulation" when two "Kami," male and female, are the children of own brother and sister respectively.

Third. The fraternal relations tend to become restricted to the children of one pair. There is also a tendency to a multiplication of distinctive terms, thus more or less differentiating from each other, the Kami numbered 9, 10, 11, 12, in Table VI. Such an instance is that of the Gournditch Mara tribe of Western Victoria.* It is instructive to note that the old fraternal terms still linger, attached to the children on the maternal side in accord with the uterine line of descent. The change has taken place on that side which leans towards agnation.

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*This prohibition includes not only "brother" and "sister," but also the "cousins" who are indicated by the term "kami." (See Table VI.) Although the kami belong, respectively, to the two intermarrying class divisions, the nearness of blood stops the marital right. We have here a prohibition counted through the male line in a tribe which has uterine descent.

Although I have not found it possible to determine with any degree of certainty the social status of any tribe from an inspection of its relationship terms, yet on the whole I may venture to say that in general the type of system, according to which the terms are arranged, is correlated in some degree with the social position of the tribe using them.

These discrepancies between ancient custom on the one hand, as theoretically inferred from the terms of relationship, and present usage on the other, as ascertained by careful observation, render it most difficult to bring the facts briefly into order, and so to marshal the evidence as to show clearly to others that which an acquaintance with a large collection of relationship terms from many tribes enables me to perceive. To bring this out with the necessary clearness would require a detailed statement of all the evidence in my possession, and, this of course, is impossible within the limits of this paper. The subjoined table, however, will serve in some degree to illustrate the preceding remarks.

TABLE VI.—*Fraternal relations.*

English.	Kurnai.	Dieri.	Gournditch Mara.
1. Elder brother	Tundung	Negi	Wurti.
2. Younger brother	Bramung	Ngattata	Kokong.
3. Elder sister	Bau-ung	Kaukū	Kaki.
4. Younger sister	Lunduk	Ngattata	Kokoyar.
5. Father's brother's son	Tundung or Bramung.	Negi or Ngattata	Wawurt.
6. Father's brother's daughter	Bau-ung or Lunduk	Kauku or Ngattata.	Wangya.
7. Mother's sister's son	Tundung or Bramung	Negi or Ngattata	Wurti or Kokong.
8. Mother's sister's daughter	Bau-ung or Lunduk	Kauku or Ngattata.	Kaki or Kokoyar.
9. Father's sister's son	Tundung or Bramung	Kami	Benangar.
10. Father's sister's daughter	Bau-ung or Lunduk	Kami	Kamutch.
11. Mother's brother's son	Tundung or Bramung	Kami	Benang.
12. Mother's brother's daughter	Bau-ung or Lunduk	Kami	Kamutch.

The speaker may be either male or female.

VII.—RESTRICTIONS UPON MARRIAGE.

In the far-reaching fraternal relations explained in the previous section there is an equally extended prohibition of marriage. The relationship, which is recognized between the persons constituting this large group of contemporaries, not only prevents there being any intermarriage between them, but even a casual amour is regarded with abhorrence; and, as I have already noted, it may be punished capitally under the moral law of the aborigines. But this restriction is not confined to the fraternal groups, for it necessarily also affects the parental and filial groups with which they are connected. These restrictions arise out of the relationships resulting from the action of the laws which regulate the class divisions of the community. Other equally stringent restrictions are connected with the local divisions of the people. I shall now briefly note what they are, and show how all these restrictions affect the choice of a wife, not only within the tribe, but even beyond it in neighboring tribes with which there is connubium.

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* See Kamilaroi and Kurnai, p. 274. Since the publication of that work I am indebted to the most obliging inquiries of Mrs. Stähle for further information concerning the Gournditch Mara. I now learn that it has a class system almost identical with that of the Wotjoballuk noted in this memoir.

1. *Prohibition arising out of the class and totem restrictions.*—The prohibition as to class divides the whole community into two halves, coinciding with those divisions, which, for convenience of reference, I have called A and B* (Table I). By this arrangement a man is restricted in his choice of a wife to one-half of the community. The women of this half are his potential wives, and he obtains either one or more of them according to certain circumstances which limit his inherited right. In some tribes the totemic regulations still further restrict his choice to one totem out of as many as perhaps a dozen which compose the class. As an illustration of the simpler case, I take the Wotjoballuk tribe of Northwestern Victoria.†

The social organization of this tribe is somewhat peculiar, and may be thus tabulated.

TABLE VII.

Primary class divisions.	Totem divisions.	Subtotems.
A. Krokitch	1. Hot wind*	Each totem has subordinate to it a number of objects, animal or vegetable, *e. g.*, kangaroo, red gum-tree, &c.
	2. White crestless cockatoo	
	3. Belonging-to-the-sun	
B. Gamutch	4. Deaf adder	Do.
	5. Black cockatoo	
	6 Pelican	

* I have omitted the original words as useless for my purpose.

Descent in this class system is uterine. A and B are the two great primary divisions, which, under different names, extend across the Australian continent.‡ The peculiarity in this Wotjoballuk system is that the primary classes divide into six subclasses which are totems, and that each totem class has associated with it a larger or smaller group of what I have called subtotems, but which might be appropriately termed pseudo-totems. They appear to me to be totems in a state of development. Hot wind has at least five of them White cockatoo has seventeen, and so on for the others. That these subtotems are now in process of gaining a sort of independence may be shown by the following instance; a man who is Krokitch-Wartwut (Hot wind) claimed to own all the five subtotems of Hot wind (three snakes and two birds), yet of these there was one which he specially claimed as "belonging" to him, namely, Moiwuk (carpet-snake). Thus his totem Hot wind seems to have been in process of subdivision into minor totems, and this man's division might have become Hot wind carpet-snake had not civilization rudely stopped the process by almost extinguishing the tribe.

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* In many tribes, as I have already noted, A and B again divide into four subclasses, *e. g.*, the well-known Kamilaroi Ipai-Kumba (A) and Murri-Kubi (B). But since this arrangement, though it extends over a vast area, is not found among the tribes specially dealt with in this paper, I do not take it into consideration here.

† Wotjo=men, balluk=people.

‡ I have now identified with each other the primary classes in their various forms from Mount Gambier to near the Gulf of Carpentaria; that is to say, practically across the whole north and south extent of Eastern Australia.

Marriage in this tribe might take place between a totem of one class and any totem of the other class. Thus a man of A 1 might marry a woman of B 4, or B 5, or B 6, and so with the other totems. The subtotems have no influence on marriage. In this tribe, therefore, the class law prohibits a man from marrying one-half of the women in the community.*

2. *Prohibition arising out of blood relationship.*—By the action of the primary divisions a man is restricted in his choice of a wife to one-half of the women. Of these again a certain number are ineligible by reason of their standing in some of the forbidden degrees of relationship to him. In the Wotjoballuk tribe with uterine descent, all the women standing to an aspirant in the relation of "father's sister" are forbidden to him, as also are all the daughters of these women. Nor would he be permitted to take the daughter of his mother's own brother, although, being of the class intermarrying with his own, she belongs to the group of women, who, according to the general class law, are his "potential wives." Further than this, by the class law itself, all the daughters of his father's brothers, as well as those of his mother's sister's, are held to be too near in blood to admit of a lawful union with them. It must be remembered that in this tribe marriages were settled by the elders, the girls being betrothed often in early childhood, so that those who made the marriages were not liable to be swayed by passion, but could calmly consider how far any proposed alliance was or was not admissible. It must also be remembered that the relatives which I have spoken of as individuals are in fact groups, and that individuals counted in these groups came into them through others—in other words, that they are "very far away" group relations. The prohibition as to some of these might be disregarded where all else was desirable; but otherwise they would certainly be insisted upon, and probably by the old women of the tribe more strenuously than by any one else.

3. *Prohibition arising out of locality.*—A further prohibition arises out of locality. Local proximity by birth is quite an insuperable obstacle to marriage in many tribes, in which a man is absolutely forbidden to

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* The four classes into which A and B divide in the Kamilaroi and many other tribes restrict matrimonial choice to one-fourth of the women. And, after the completion of this memoir, I received from Mr. Allan M. Giles, of Tennant's Creek, Northern Territory, an extremely interesting and valuable communication on the Waramunga tribe, which is divided into eight classes, demonstrably subdivisions of the four classes above mentioned. The Waramunga classes limit the choice of a wife to one-eighth of the women.

marry a woman of the same subhorde or sub-clan. However eligible she may be in other respects, the fact that both parties belong to the same locality is held by certain tribes, the Kurnai for example, to make them "too near each other," that is, too near in blood. Even in some of the tribes which have uterine descent and a vigorous class system I find this to be the case; and bearing in mind what the Pirauru practice really is, one can easily understand how all the people of any given horde may come to consider themselves, and with good reason, too nearly related to admit of marriage without mixing the same "blood" or "flesh."

In tribes where the classes and totems have been weakened, or almost extinguished the local organization in hordes, or in clans, has assumed an overwhelming preponderance, and the local restraints upon marriage are strictly enforced. The Kurnai tribe is a good instance. In it, as I have already said, the totems have become practically extinct; and the local groups have become so strictly exogamous that sexual intercourse between members of the same division of a clan is looked upon with the utmost abhorrence. In olden times—that is, before Gippsland was settled by the whites—these local groups must have been bound together in a most extraordinary network of relationships. For, as I have already pointed out, the Kurnai terms of relationship exhibit a most primitive type, and the parental and filial groups are of very wide extent and may be traced into surprising ramifications.* Moreover the filial relations were inherited, carrying with them fraternal relations in ever widening lines. Again, the children of brothers and the children of sisters' own or tribal, were brothers and sisters to each other as far as descents could be counted. It is not surprising that in such a tribe the difficulties in the way of any young man finding a girl among those locally eligible, who did not stand in some forbidden degree of relationship, should have been next to insurmountable.

Restrictions such as those I have now briefly noted are found in all Australian tribes, but in some more than in others. When one reflects upon the wide prohibition of class and totem of relationships, and of locality, and adds to these disabilities all the further restriction of blood feuds, one cannot feel surprise that the question of marriage between any given couple should be the subject of deep and careful consideration by the elders of the community, and that it should often prove an insoluble problem to those who seek to bring it about.† No wonder that under such conditions the young people of Australian tribes, being still further hindered by the practice of betrothal of infant girls, so often take their own course, and cut the gordian knot of restriction by elopement. In Gippsland, where these restrictions were of exceptional extent, so as to form a net in whose meshes every individual Kurnai was almost certainly entangled, the solution of the difficulties raised by the nearly absolute impossibility of obtaining the consent of parents was found in the practice of elopement, which was the most prevalent form of marriage.

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* I have often noticed that the whole Kurnai community appeared to be related. Every one seemed to be the father, mother, son, daughter, brother, or sister of every one else, but when special inquiry was made, the "tribal" relationship was distinguished from the "own" by more precise statement, as the "other (brebba) father," "other mother," &c.

† The "nation," consisting of the Aldolinga and at least three other tribes of Central Australia, affords a good instance of the extensive marriage prohibitions arising

VIII.—THE CHANGE IN THE LINE OF DESCENT.

In a late memoir* dealing with the change of descent in Australian tribes, the practice of infant betrothal was assigned as probably the chief cause of the change. But I have come to see at the root of betrothal the belief which I have noted in a previous section of this memoir, "that the child is derived from the male parent only, and that the mother is no more than its nurse." This belief has been active in other directions. It has aided the local organization, whose perpetuation from father to son is its direct expression, to over-ride the social organization; and, together with betrothal, which produces the sense of separate ownership, it has tended to bring about ultimately individual marriage, with a change of descent from the "group of female Pirauru" to the individual male "Noa."

This belief in the renewal of a man in his son is not, nor has it been, confined to the Australian aborigines. It is probably as old as the time when men first began to speculate upon the phenomena within and without themselves. Dr. Hearn, in his valuable work, the Aryan Household,† shows that the "worship of the house-father" is founded on the very belief which I find among the Australian savages. It is found distinctly enunciated in passages of the classical writers, and it forms the central idea on which Æschylus has caused the third part of his majestic Orestean trilogy to turn. Often as the case of Orestes has been quoted, it seems to me that, as examined by the side-lights of Australian custom, there may be even yet some views of it whose significance has not been clearly seen. I may be excused for briefly considering it here, because it seems to me to raise some curious questions as to the existence of uterine descent among the Hellenic ancestors.

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out of the combined influence of class divisions and of locality. These tribes are divided socially into four classes, which cover at least sixty-four local groups. According to my present information (which is not yet complete) the matrimonial restriction arising out of the four classes is as usual, but in addition a man's choice is in every case confined to a few of the local groups. (Informant, Rev. H. Kempe.)

I have endeavored to show in the Dieri the prohibitions arising out of class and close relationship, and in the Kurnai those arising out of close relationship and locality. In the Aldolinga all these restricting forces combine, and result in the narrowing down of the matrimonial choice to an incredibly small fraction of the whole number of women.

* "From Mother-right to Father-right," by A.W. Howitt and Lorimer Fison. Journal of the Anthropological Institute of Great Britain and Ireland. August 1882.

† The Aryan Household. W. E. Hearn, LL. D. G. Robertson, Melbourne, 1878.

In the Orestean trilogy, of which the Eumenides forms the final and most striking part, Æschylus had apparently several objects in view. He glorified the institutions of the Athenian people by assigning a divine origin to their great council, the Areiopagos, doubtless as opposed to the "modernizing institutions;" he showed the perfect action of an ancestral curse, together with divine vengeance upon a doomed race, the impious house of Pelops, and those who had become engrafted upon it; and I venture to think that in the Euimenides he also gave a dramatic version of the change effected in past ages in the line of descent. The whole gravamen of the charge against Orestes is that he has shed the blood of his mother "being kindred." In reply for the defense Apollo delivers a dictum, which, he takes care to state, is derived directly from Zeus himself, and this dictum is confirmed by Athene, the embodiment of Divine wisdom. The words placed in the mouth of Apollo are those I desire to note. In the course of the prosecution of Orestes, the Erinyes declare their ancient jurisdiction to be over those who have shed the blood of kindred, and they claim the right to "hale below"* the accused, he having "poured out upon the ground the kindred blood of his mother."† In reply to this, Apollo, as counsel for the defense, raises a nice point, on which, as the mouth-piece of Zeus, he declares the law. He denies the authorship of the child to the woman, declaring that she receives the germ merely "as a bailee," so to speak. The sire, he says, is the author, for whom she preserves and nourishes the young plant, as for one to whom she is united by ties, which, though sacred, are expressly denied to be those of kinship.‡ (ξέένῳ ξένῃ.)

Here we have precisely the sentiment already quoted by me from my aboriginal informant, that "the man gives the child to a woman to take care of for him"; and this I recognize as being at the root of changes which have occurred in the social organization of the Australian tribes. Æschylus shows the uterine line of descent as being the foundation on which rested the jurisdiction of the Erinyes, "assigned to them at their birth,"§ and therefore of venerable antiquity. By the equally divided vote of the judges he shows men's minds halting half-way between the old views and the new, and he assigns the cause and the reason justifying the momentous change which was effected under a direct divine mandate through the mouth of the prophetic Apollo. It seems to me that these conclusions may be drawn from the language used by the *dramatis personæ*, and moreover that Æschylus may possibly have had such conclusions in his mind when composing the Orestean trilogy.

It has been a feature of the past history of mankind that great and momentous changes have been made under an alleged divine direction. Of old the lawgiver was the priest, and the priest declared himself to be the divine mouthpiece. In the course of time the office of lawgiver became separated from that of the priesthood, but at the time pictured by Æschylus the two offices were still united. In savage tribes, such as those of Australia, it cannot be said that there are either priesthood or lawgivers, in the modern sense of the words; but it is possible to see what I may call the germ of these offices, prepared under favoring conditions to develop into active existence.

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* Eumenides, 257, Camb. Texts.

† *Ib.*, 623.

‡ Eum., 627 κ.τ.λ.

§ *Ib.*, 320, 329.

As I have said, there is no priesthood in the Australian tribes; but in their wizards I can recognize those who, if I may use the expression, already stand at the threshhold of the temple, prepared to advance and take their place at the altar when the edifice shall be completed.

These men profess to be in communication with the ancestral spirits and with the great Supreme Being, the founder of their race, whose sacred ceremonies of initiation they conduct and of whose laws—the ancestral customs—they are the depositaries. Were I to find an explanation given by an Australian tribe to account for the change in descent in their class system, I doubt not I should find it attributed to a command from their Great Spirit, through the mouth of the tribal wizard. This, indeed, is almost implied by the statements which I have heard made by old men at initiation ceremonies, that all the institutions of the tribe were in the first instance established by him whom they speak of and reverence as the All-father of the tribe.*

It seems to me that the important bearing of this primitive belief is only now beginning to be appreciated. When its influence upon the development of early society, and upon the beliefs of the early world, is fully recognized, it will be found that its effects have not been confined to the development of the ancestral worship of our Aryan forefathers.

IX.—CONCLUSION.

The subject which I have dealt with in, I fear, but an imperfect manner, is one of the most difficult of those which are met with in studying savage society in Australia. In the Australian terms of relationship there are many anomalies which cannot be explained without a competent knowledge of the dialects in which they occur, and of the customs of the tribes using them. Such a knowledge is not to be looked for in any one investigator. The present memoir must, therefore, be looked upon as no more than an attempt to "prospect" the rich field which has so long awaited examination. How far I may have succeeded in the attempt I will not venture to surmise, but will leave it for the consideration of anthropologists.

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* I find that the great Supreme Being, who, as the Australians believe, lives in a land beyond the vaulted sky, is known under many different names in the various tribes, perhaps under as many names as there are tribes. These names, being connected with the initiation ceremonies, are often too sacred to be uttered by the tribesmen save during the celebration of those "mysteries" from which the uninitiated are excluded. For instance, the Woiworung tribe of the Yarra River district called the "Great Spirit" Bunjil; the Wiradjeri tribe of the Lower Murrumbidgee call him Baiame, and the Murring of the mountains and of the coast call him Dáramūlún. But these names are not for common utterance. They are generally reserved for the secret ceremonies of initiation, and all these tribes usually and in preference speak of the Great Being by words meaning in their several languages "our father." The Kurnai of Gippsland know him only by this name (Mungan ngaura) and utter it, when compelled to do so, with reverential awe. I have seen Australian blacks, when referring to their Supreme Being, do so by gesture, thus avoiding the utterance of his name.

I think, however, I may venture to say that I have shown good grounds for accepting the following conclusions:

1. The class divisions and totems are groups held together by common descent.

2. The class divisions and the totems form in the aggregate two exogamous intermarrying divisions of the community.

3. The marriage relation between these two exogamous divisions was probably at one period the common co-habitation, as occasion, food, supply, and other conditions allowed, of a group of males belonging to one division with a group of females belonging to the other division; and that even now this communal marriage exists in a somewhat limited form.

4. The marital relations, being those of group to group, the terms of relationship which arose and were used, necessarily expressed this relation of group to group, as well as of the individual to the group, and of the individual to the individual.

5. The filial relations of one generation to the preceding generation are those of group to group, and are clearly brought into view by the Pirauru practice, under which the children are necessarily the children of a male group, and not of an individual.

6. The conditions of 3 and 5 necessarily require those terms which I have tabulated as the "fraternal."

The evidence, which I have endeavored to state with clearness, is, I I feel, very incomplete, and therefore wanting in that entire unity which I should have liked to give it. But, looking at the facts which have been ascertained, I venture to submit that the systems in use among the Australian tribes indicate relationships which have been, and are, fully as real to them as ours are to us; that the terms have arisen under social conditions whose survival we may now distinctly recognize as still existing in the least advanced tribes, and that they have been developed and modified under the influence of changing social conditions, just as language, laws, religions, and even society itself have been developed and modified.

The Australian evidence, as far as it has been systematically collected and examined, supports in the main the views enunciated by the late Dr. Lewis H. Morgan. He was subjected to violent attacks by certain critics, who held views to which his own, if accepted, were fatal. This confirmation of his conclusions will be gratifying to all who, like myself, admire his single-hearted search after truth, and who feel a sincere respect for his memory.

MOUNDS OF SANGAMON COUNTY, ILLINOIS.

By JAMES WICKERSHAM, *of New Tacoma, Wash. Terr.*

If depth in the earth is a standard by which to judge the age of the relics of a race, there have been some found in Sangamon County, Illinois, which may with safety be referred to a very great antiquity.

At many places along the Sagamon River are what are called "sand bluffs." They are stratified, the strata being composed of sand, gravel, or clay, and varying in thickness from an inch to 3 or 4 feet. These bluffs are of more recent origin than the clay and stone bluffs along the stream. They have, however, the same forest covering. About 4 miles northwest of the city of Springfield are some of these bluffs, from which great quantities of building sand are obtained. The pit to which attention is particularly directed is situated on the west side of the Carpenter's Mill wagon-road, and about 100 yards southwest of the Sand Hill school-house. In this pit, at a depth of about 15 feet, is a stratum of clay from 12 to 20 inches in thickness. A workman engaged in loading his wagon with sand from immediately underneath this layer of clay came upon some bones of a reddish color, and two pieces of stone of a peculiar shape. He recognized in the bones the skeleton of a human being. In being removed from its sandy bed the skull was crushed to pieces, but some of the larger bones of the body were carefully placed under an overhanging bank out of the way. With the bones were found two stones, one an ax of common pattern and of good workmanship, now in possession of the writer, and the other is described as triangular in shape, and "with some funny marks cut on it." A boy who was assisting the workman brought the stone ax home, and the writer received it from his hand; the other stone was placed with the bones, and they have unfortunately been lost by a "slide" in the pit. Inquiry among other workmen brought to light the fact that several of them had found arrowheads or spear-heads in the pit. Of so little importance did they deem them, however, that but one could be recovered, which was given to the writer, and is now is his collection. This is a spear-head about 5 inches in length. The barbs and a small part of the base were broken off when struck by the spade; otherwise the head is in good shape and shows superior workmanship. It was found on a layer of clay, some 2 or 3 feet lower in the pit than the skeleton, but not immediately under the skeleton, nor by the same workman. Three different theories have been advanced to account for the presence of these objects at so great a depth: (1) That they were carried from the surface by a "slide" in the banks of the pit; (2) that they were buried from the surface by a prehistoric race; and (3) that they were deposited in the bluff during the period of its formation.

There are many Indian cemeteries along Sangamon River, and at first it was believed that a "slide" of the banks of the pit had carried from near the surface the skeleton and weapons of one of these ancient inhabitants of our country. The workman who made the discovery said that he first removed the layer of clay, and then found the skeleton in the sand under it; and the boy who was assisting him, and who was present, corroborated his statement. Workmen who found arrowheads or spear-heads were positive that they had not been carried by a slide to where they were discovered. They were lying in the sand just above a layer of clay, and, in one instance, in the clay. Being under level ground, and quite a distance from a bank or hill of any kind, it is impossible that they could have been deposited by a slide of the earth prior to the opening of the sand pit. It is not likely that they were buried from the present surface. If nothing but the skeleton and accompanying stones had been seen, this might have served as an explanation; but at different places in the pit, and at different levels, other objects were found. It is not probable that they were buried singly at such a depth. After a careful examination the writer is firmly convinced that the third theory is correct, viz, that the objects were deposited in the bluff during the period of its erection, or growth.

ROSS MOUNDS.

On the north bank of the Sangamon River, in Cooper Township, on the SE. ¼ of the SE. ¼ Sec. 5, is a group of mounds of more than ordinary interest, from the fact that an attempt was made by the builders to protect a tract of land by mounds on all its sides easily assailed by an enemy.

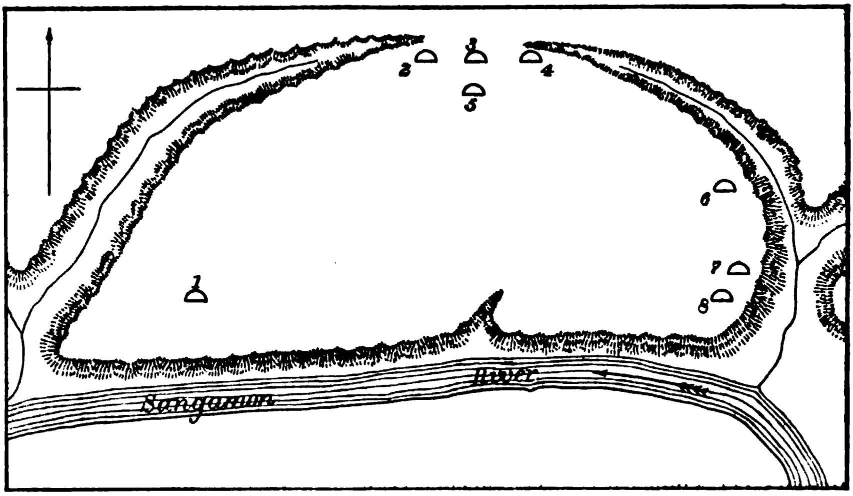

FIG. 1.—Ross Mounds, Sangamon Co., Ill.

The south face of the bluff along the river is almost perpendicular, and it would be difficult for an enemy to make a successful attack from this direction. Consequently no mounds are found here. At the western point, however, an ascent might be more readily made, and here we find a mound. The northwestern face, along the spring branch, is also very steep and easily defended. At the east end the bluff would be easily ascended, and here were built three mounds. But the point most liable to attack, and the hardest to defend, the point at which an enemy might rush across level ground into the encampment, lies between the heads of the two little spring branches, and was defended by four mounds. At all other points, except where the mounds are placed, the bluff is so steep and hard to climb that a few resolute men on top could repulse a host. Opposite the mounds an entrance to the high level ground would be easy. Mounds 1 to 6 are oblong, 1, 5, and 6 having the greatest length north and south, and 2 to 4 the greatest length east and west. These long mounds are about 20 feet in width, 50 feet in length, and 18 inches height. Mound 7 and 8 are round, 7 having a diameter of about 30 feet by a height of 18 inches, while 8 has a diameter of 50 feet by a height of 2 feet. The bluff is covered with heavy timber. The immediate neighborhood was known to the Indians and early settlers as good hunting grounds. No exploration was made.

OLCOTT MOUNDS.

About a quarter of a mile above the junction of Horse Creek and South Fork, on the east bank of the latter, in Rochester Township, on the SE. ¼ of the NW. ¼ Sec. 20, is a group of mounds. The following is a sketch of the location and surrounding natural features:

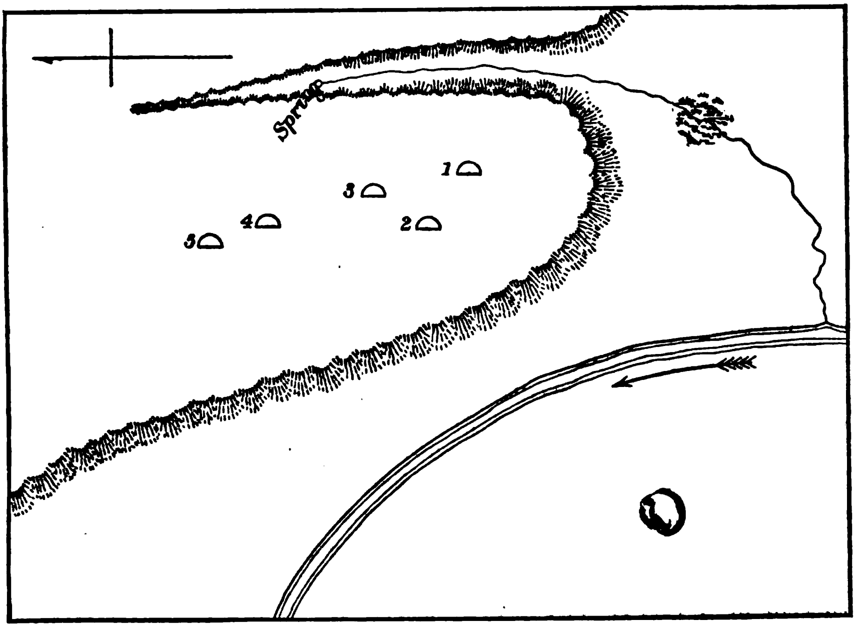

FIG. 2.—Olcott Mounds, Sangamon Co., Ill.

Mounds 1 to 3 are longest north and south (30 by 50 feet), and from 16 to 18 inches in height. Mounds 4 and 5 are round, 4 having a diameter of 50 feet and a height of 4 feet, while 5 does not exceed 40 feet in diameter nor 3 feet in height. The bluff on which the group is located has been cleared of heavy timber for several years, and is now used as pasture land. The writer assisted in exploring mounds 1, 2, and 5; but no archæological objects were found. Upon a former excavation, in mound 4, Mr. Olcott discovered, at the level of the bottom of the mound, a skeleton in such a decayed state that only parts of it could be removed. The skull was broken into small pieces. The body had been buried at full length, with the head to the west, in the center of the mound. Nothing was found but the skeleton. It was impossible to determine where the material was procured for the erection of these mounds. Usually depressions near by indicate the spot, but no such depressions appear in the neighborhood of this group. No particular arrangement of the material was observed. The location of this group placed the builders between a good spring and a river of clear water. A quarter of a mile to the northeast was the open prairie; and a like distance to the southeast was a peculiar spring, now known as the "Old Lick Spring," where the buffalo congregated to lick the ground, leaving a hole 6 or 7 feet deep by 50 feet in diameter. The "early settlers" were in the habit of repairing to this spring, and salting a log and then lying in wait for deer. It is not improbable that the mound builder may have supplied the family larder in a similar way centuries before. The center of the "lick" is a quagmire several feet deep, covered with a tough growth of moss.

DAWSON MOUNDS.

On the east bank of the South Fork, 2 miles south of its juncture with Sangamon River, in Rochester Township, on the SE. ¼ of the NE. ¼ Sec. 4, are two groups of mounds. The following plan shows the number and relative position:

Mounds 1 to 4 are on the bluff, 30 or 40 feet above South Fork, while mounds 5 to 10 are on a similar bluff above Rochester Creek. These bluffs are almost perpendicular on the faces next to the streams, while in the center they slope smoothly down to a spring branch. The ax of the "pale-face" has not yet invaded the woods on these bluffs, except to clear the roadway passing between mounds 2 and 3. A peculiarity of the mounds in these groups is that they are not round, but have, generally, the greatest length from north to south, although mounds 6 and 7 have their greatest length east and west. They will average 40 feet in length by 20 feet in breadth, and from 18 to 20 inches in height. No excavation was made by the writer, but in mound 10 was a large hole, showing quite plainly that some person had explored therein at a recent date. Some years ago, while the road leading through 1 to 4 was being worked, human bones were thrown from one of the mounds, but from which one it could not be ascertained. The builders of these structures were in the neighborhood of everything necessary to savage life, good hunting, fishing, tillable land, drinking-water, and fuel.

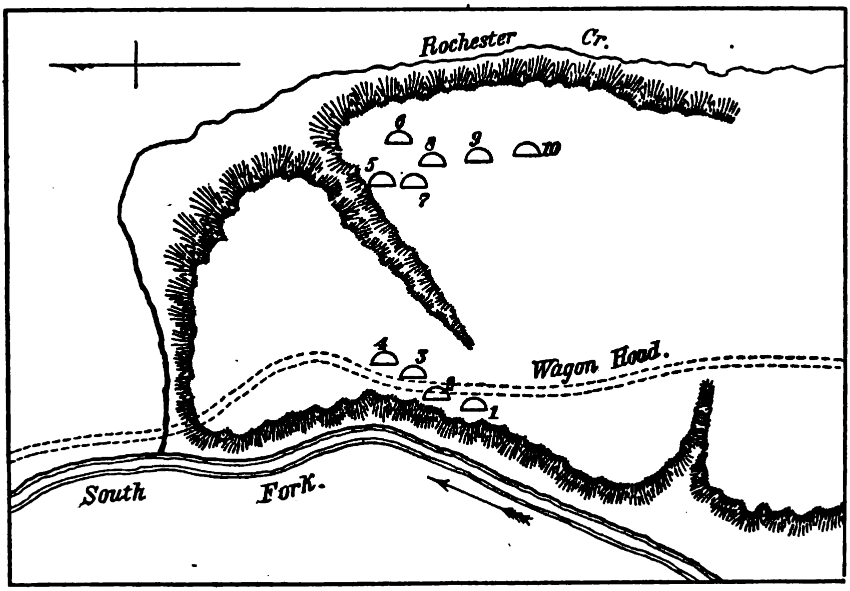

FIG. 3.—Dawson Mounds, Sangamon County, Illinois.

M'CLERNARD MOUNDS.

A mile and a quarter south of the junction of South Fork and the Sangamon River, on the east bluffs of South Fork, on the SE. ¼ of the

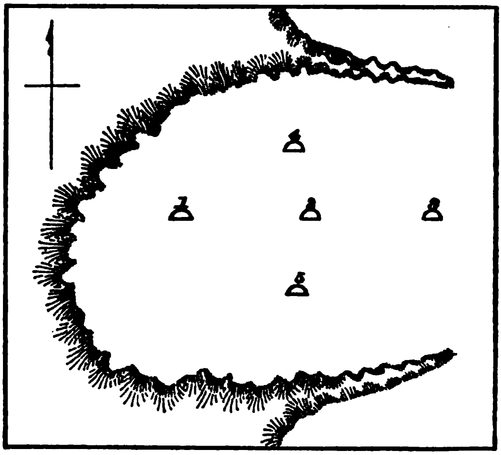

FIG. 4.—McClernard Mounds, Sangamon County, Illinois.

SE. ¼ Sec. 33, in Clear Lake Township, is a group of five mounds. It lies on a hillside sloping toward the stream, and a quarter of a mile to the east of South Fork. The following plan shows grouping location:

Mounds 1 to 3 are round, 50 or 60 feet in diameter, and 18 or 20 inches high. Mounds 4 and 5 are about 50 feet long, by 30 wide, and 18 inches high. Lines drawn through the center of 4 and 5, from end to end, would meet in the center of 1. These mounds are 100 feet apart. No exploration was attempted. The ground is in cultivation as grass land, but the mounds are still quite distinct. Back on the bluff, to the east a short distance, was the prairie; to the west a quarter of a mile, South Fork; on the north and south small spring branches.

WATSON MOUNDS.

A quarter of a mile south of the bridge, where the Clear Lake wagon-road crosses Sangamon River, in Clear Lake Township, on the SE. ¼ of the SE. ¼ Sec. 21, is a group of four mounds. The following sketch will show the location of the mounds with regard to each other, as well as to the surrounding natural features:

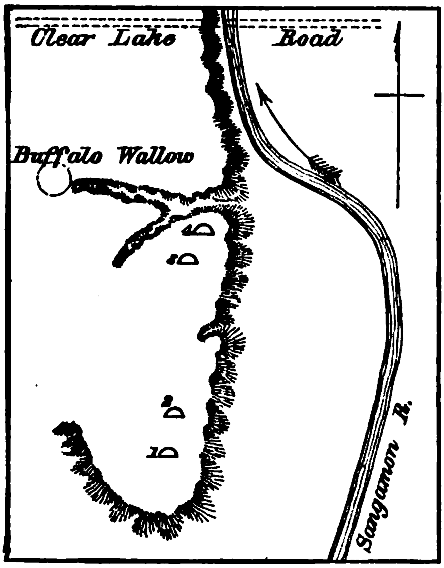

FIG. 5.—Watson Mounds, Sangamon County, Illinois.

Mounds 1 to 3 are round, 1 and 3 being probably 30 feet in diameter by 18 inches in height, while mound 2 is about 40 feet in diameter by 18 or 20 inches in height. Mound 4 is about 40 feet long, east and west, by 20 feet in breadth, and 18 inches in height. Mounds 1 and 2 are probably 50 feet apart; 2 and 3 are 150 yards apart; 3 and 4 about 100 feet. No excavation was made. The mounds follow the line of the bluff north and south. The ground at the south end of the bluff has been in cultivation for several years, but the mounds are still quite distinct. The eastern face of the bluff is almost perpendicular. Between the bluff and river is low, marshy ground, but the river bends in to the bluff a little farther up. Mound 4 is in the timber, but tillable land, springs, and the river are near.

LYON MOUNDS.

Up Sugar Creek, about a mile from its junction with the Sangamon River, are two mounds. They are situated on the east bank of Sugar Creek, on a bluff 30 or 40 feet high, on the SE. ¼ of the NW. ¼ Sec. 28, in Clear Lake Township. The following sketch will give some idea of their situation:

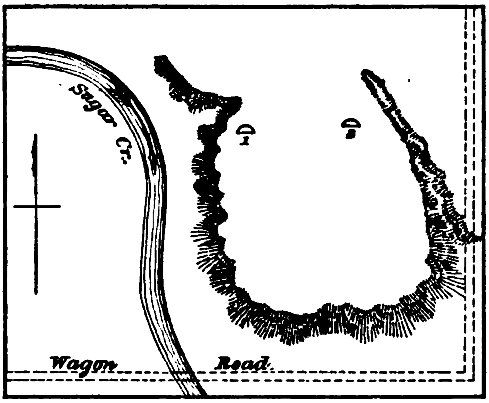

FIG. 6.—Lyon Mounds, Sangamon County, Illinois.

Mound 1 is 50 feet long, north and south, and 30 feet wide; mound 2 is 70 feet long, east and west, and 50 feet wide; they are each 16 or 18 inches high, and are 180 feet apart. No exploration was made. The timber has been removed from the land, but the ground has not yet been explored. The builders of these mounds found in their vicinity an abundance of good water, hunting, fishing, and tillable land.

FARR MOUNDS.

On the north bluff of Sugar Creek, about 2 miles above its junction with Sangamon River, on the NE. ¼ of the NE. ¼ Sec. 29, in Clear Lake Township, is a group of nineteen mounds. The following plan (Fig. 7) shows the manner of grouping:

Mound 1 is 80 feet, and mound 2 is 100 feet long; they are each 40 feet wide and 2 feet high. Mound 5 differs from other mounds in that a projecting arm from the northwest side connects it with a smaller mound. All the other members of the group are round, and range in diameter from 20 to 50 feet, and in height from 10 inches to 2 feet. Mounds 1 and 2 are on the southern hillside and in the woods. The others are on land that has been in cultivation for twenty years, and stand on the top of the bluff. The writer made an excavation in 1, but found nothing.

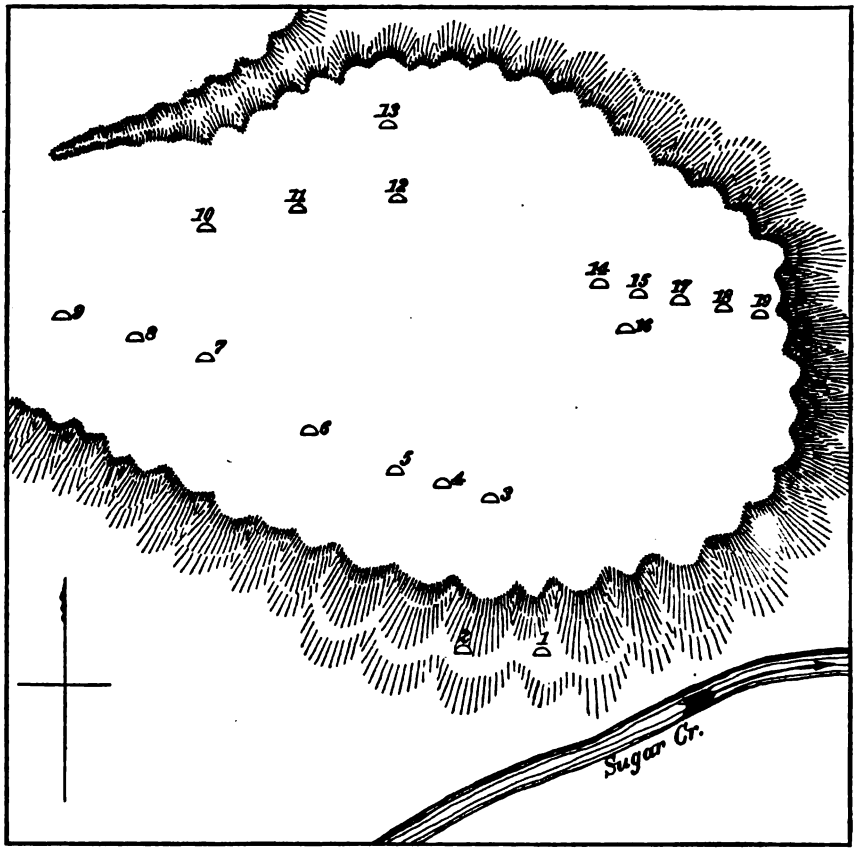

FIG. 7.—Farr Mounds, Sangamon County, Illinois.

No particular arrangement of material was noticed. On mound 2 is a white-oak stump, 3 feet in diameter, and a standing white-oak tree 18 inches in diameter. On the end of the bluff where mounds 14 to 19 stand have been found some very large stone axes, weighing 9 or 10 pounds. To the north of this group, a quarter of a mile or less, was the prairie; on the north side of the bluff, springs; on the east, a spring branch; on the south, Sugar Creek.

MUD LAKE MOUND.

At the south end of Mud Lake, in Clear Lake Township, on the NE. ¼ of the NE. ¼ Sec. 17, is a mound that may with some propriety be called a "connecting link" between the mound builders and the modern Indians. It is situated on the bluff 40 or 50 feet above the water, and about the same distance to the westward of the lake. Originally the bluff was covered by a heavy growth of timber, but it has now been cleared, and will no doubt soon be in cultivation. Only one mound was found, the diameter of which is about 30 feet, and the height 18 inches. The material used in its erection seems to have been camp rubbish, broken pottery, bones, shells, &c. Near the mound are several depressions in the earth from 4 to 8 inches in depth and about 30 feet in diameter. In the memory of the "oldest inhabitant," Indian wigwams have stood over similar depressions. It is not unreasonable to conclude, then, that this mound once stood in the center of an encampment of Indians, by whom it was erected through the daily accumulation of rubbish, bones, shells, &c.

RICARD'S LAKE MOUND.

Between Spring Creek and a small lake known as Ricard's Lake, in Gardner Township, on the SW. ¼ of the NW. ¼ Sec. 25, is a mound situated on a ridge. The lake is about 200 yards south of the stream, and the mound is midway between the two. The diameter of the mound is 50 feet and the height 5 feet. The material with which it was built was taken from the surface of the earth immediately around the mound. If any particular arrangement of the material was attempted it was not apparent in the hasty and very imperfect excavation made. At a depth of 3 feet, at the center of the mound, two bowls of rude pottery were found. They were side by side, and though the settling of the dirt, after the completion of the mound, had broken the bottom and sides somewhat, it had not overturned them. What they may have contained when first buried could not be ascertained from the inspection given after exhumation. The excavation was not carried deeper, and no other relics were discovered. The ridge on which this mound is located has never been cleared, although some of the larger trees have been cut for lumber.

CONVERSE MOUNDS.

On the west side of Spring Creek, and about a quarter of a mile from its junction with the Sangamon River, in Springfield Township, on the SE. ¼ of the NE. ¼ Sec. 10, was, at one time, a group of mounds. They were situated probably 100 yards back from the stream, on a broad hillside sloping toward the south and east. The ground has been cleared of the forest, and under cultivation so long that almost all traces of the mounds have been lost. A resident of the vicinity, however, assured the writer that before the land was cultivated, and even for some years afterward, they were quite prominent. No plan of the group could be made.

REISCH MOUND.

On the bluff west of Sangamon River, and a half a mile down the stream from the mouth of Spring Creek, in Springfield Township, on the NW. ¼ of the SE. ¼ Sec. 3, is a small mound. It is quite probable that there was a group of mounds here, but the land has been under cultivation for a number of years, and all traces of other members of the group have disappeared. The one mentioned escaped destruction by being too far out on the point to be easily plowed over. This point has, however, been prepared for cultivation, and this solitary mound will soon "join the innumerable caravan" of mounds that disappears through plowing. The diameter of this structure is about 30 feet and the height 2 feet. An excavation to the bottom was made, but nothing except a few pieces of charcoal was found. The material of which it was constructed was scraped up from the surface near, and no arrangement, apparently, was followed in its construction. It was built in the woods near the prairie, spring water, and good tillable land. A fine flint hoe was found by the writer near it, besides several arrowheads. Many stones may be picked up on the bluff, having one smooth surface, and showing the action of fire.

MISCELLANEOUS.

It is believed that not more than one-third of the mounds of this county have been described in the foregoing papers. All have been given, however, that have been visited by the writer. He has been informed that there are many more along the streams in the county, and particularly along South Fork, and Horse, Sugar, and Lick Creeks. On the farm of Benjamin F. Caldwell, in Chatham Township, on Lick Creek, is a group of twenty-five or more. On Cantrall and Richland Creeks, in the north part of the county, there are groups; also on the east shore of Clear Lake, in Clear Lake Township. In fact, wherever high land is found near good running water a search will, in most instances, reveal earthworks of the Mound Builders. From the writer's knowledge of the county he is of the opinion that there are probably one hundred and fifty mounds along the lakes and water-courses within its borders. They are singularly barren of relics of the builders, and, as compared with the prodigious works of this race found near the large streams of the Mississippi Valley, they are small indeed; still they are interesting as part of a great system which could only be incompletely studied without some knowledge of its poorer and smaller numbers. From the absence of any description it might be supposed that there were no work-shops, ancient camping places, or cemeteries in this county, but, on the contrary, there are many of each. On every spot of high ground, near good water, may be found greater or smaller quantities of flint chips, sometimes in such quantities that bushels of them may be collected. One field is known near the Sangamon River, where wagon-loads of chips may be easily picked up. They are from the peculiar dark stone out of which all the axes of this country were made, and a spring branch on one side of the field reveals the fact that the stones were taken from its beds and banks. Thousands of pretty smooth ones yet remain there. Most of the work-shops, however, were at ancient camping places, and white flint was used for arrows, as the flakes show. On these spots will also be found blackened stones, arrows, pestles, mortars, axes, &c., showing that here once stood an aboriginal encampment. Each plowing of the ground reveals relics, most of which are carried to the house and "given to the children to play with."

Of relics found in this county may be enumerated: Axes, stone and copper, arrows, spears, pestles, mortars, pottery, pipes, hoes, spades, knives, whetstones, "picks," stone pendants, and flat oval stones with holes at each end. While the mounds of this county are very poor in relics, the ancient camping places are rich. In the writer's collection is an ax found on the field mentioned that weighs 9½ pounds, and is of perfect form. A few miles farther up the river one was found that weighs 10½ pounds; it is now in the Illinois State Museum. Near a spring on the South Fork of the Sangamon a gentleman dug up a handsome little copper ax, which is in the writer's collection. It is the only piece of copper that has so far been found in the county. Axes occur of all sizes known to collectors. Arrow and spear heads range from three-quarters of an inch to 6 inches in length. The writer has one pestle, one mortar, two hoes, and a fine spade. The latter was found by a Mr. Dawson, about 100 yards south of the "Dawson Mounds," and is 13½ inches in length by 5½ in breadth. It is quite smooth at each end, showing that it was used a great deal. A stone pick was found about a mile north of Springfield. It is about 6 inches in length, shaped like the common pick without a hole, however, and was probably fastened in the usual way by a withe. Only one end of it was ever used. In the writer's collection is also a plummet of Missouri iron ore, but it was found on Lily Lake, in Fayette County, Illinois.

MOUNDS IN SPOON RIVER VALLEY, ILLINOIS.

By W. H. Adams, *of Elmore, Ill.*

On the north side of Spoon River, 75 yards distant, 80 rods west of the east line, and 20 rods south of the north line of Sec. 12, T. 11 N., R. 43 E., of the fourth principal meridian, is a round mound about 30 feet in diameter, called by those in the neighborhood a "hog-back." On the highest point of the hog-back, at the surface, is some evidence of fire. The evidence of a former fire increases very rapidly. At a depth of 12 to 16 inches I found five skeletons, nearly all the bones of which were calcined by fire, and many of them entirely consumed. One of the skulls lay to the north, one to the northwest, one to the southwest, one to the south, and one to the northeast. With the bones were fragments of sandstone burnt red. At or near each skull, and nearly on a line between the point of the shoulder and ear, was a water-worn pebble, except in one instance, and that was an angular piece of flint. The pebbles had not been acted upon by the fire, so that they must evidently have been placed there after the intense heat of the fire had subsided. From the appearance of the earth, one would be strongly inclined to believe that the fire in this instance had been one of unusual intensity. From the position of the skulls to each other the feet of one body would reach to his neighbor's head, if laid at full length. One of the skulls was rather thinner than those we usually find in other mounds. Some of the teeth evidently belonged to a person of great age. Other of the teeth were very small, but I cannot say that they belonged to an infant. The skulls were in fragments, the largest piece obtained being about 2 inches square.

On another "hog-back," east of the one described, commencing on Sec. 12, T. 11, R. 4, E., extending across the NW. corner of Sec. 7, T. 11, R. 5, and also some distance on Sec. 6, T. 11, are thirteen common round mounds, varying in height from 18 inches to 5 feet. As far as examined these are burial mounds, and in one mound I found nineteen skeletons. This mound was 45 feet in diameter, and 5 feet in height. The bones in it were in a fair state of preservation. I opened four or five of this group, and in each were found pieces of trap-rock from 1½ to 2 inches square, pieces of burnt sand-rock, small water-worn pebbles, which I supposed to be jasper or something of that character, and in the largest mound a very small fragment of red pottery.

On the high bluff between Spoon River and Walnut Creek, on the south line of the SE. ¼ of Sec. 6, T. 11 N., R. 5 E., are three mounds of some importance. The first is a common round mound, 3½ feet high, with a base diameter of 40 feet. This mound is 3 rods north of the sectional line between Sec. 6 and 7, and 60 rods west of the east line of Sec. 6. The land is owned by Mr. Henry Jacques. I opened this mound at the apex, and at a depth of 2 feet found quite an amount of ashes; also one piece of trap-rock of irregular shape, about the size of a small boy's head, and a hornstone arrow-point of the leaf-shape pattern. Eight feet east of this is a mound 62 feet long and 19 feet wide, with the greatest length from southwest to northeast. I made a cross-cut of this mound at the middle, and in the center found a bed of charcoal, 10 inches deep, intermingled with ashes. I also made an opening near the east end, and found nothing. Twenty rods east of this, on the sectional line, is an oblong mound, measuring 64 feet from west to east and 47 feet from north to south, with an apparent height above the surrounding level of 3 feet. I made an opening in the center of this mound, 4½ feet in diameter, and at a depth of 2 feet I found some ashes and fragments of stone, which had been polished, and 3 inches of yellow clay. This clay has the appearance of its having been rammed or packed while in a plastic state. Below the packed clay is a thin stratum of red paint, and below the paint, ashes and paint intermingled. In this material we found fourteen arrow-points made of hornstone, all of the leaf pattern except one, and this was 3½ inches in length, with notches at the heel, and had the appearance of having been used; also a small piece of galena. Six of the arrow-points lay with their points to the west, one to the southwest, one to the east, and one to the north.

There was a slight depression on the surface above the deposit. I made an opening 9 feet east of the center, in which we obtained a copper awl or needle, 3½ inches in length and three-sixteenths of an inch square, thick in the middle and sharp-pointed at each end. This copper implement was inclosed by some material, which, under a microscope of low magnifying power, has the appearance of being the bark of a tree. This tool lay with the points southwest and northeast. I also found a white flint spear-point or lance-head 4 inches in length and 1½ inches wide, without notches at the heel. We found the flint implement some 10 inches southwest of the copper, which was surrounded by the same red material as the first.

I made an opening 14 feet west of the center of this mound, and at a depth of 3 feet 8 inches I found a copper needle or awl, rounded and pointed; three copper beads one-fourth of an inch in diameter and three-sixteenths of an inch in length; one piece of copper tubing or bead 1 inch in length, and one-fourth of an inch in diameter; one piece of tubing or bead three-sixteenths of an inch in diameter and 1 inch in length; one piece 1⅝ inches in length and one-fourth of an inch in diameter; and five other pieces very like those described; also a small fragment of a tooth, but I was not able to determine positively the animal to which it belonged, but think it belongs to a human being; also several small flint pebbles.

There are traces of a breastwork or fort commencing at the southwestern part of this mound, about 6 to 12 inches in height. Commencing at the mound it extends 120 feet to the southwest, thence 67 feet south, thence south-southeast 106 feet, thence to bluff of Spoon River (bluff 40 feet high), 130 feet from bluff to mound in a straight line SE. 186 feet. All the arrow-points were finely finished, and far superior to those found on the surface of the ground. This mound is 42 rods west of Spoon River. The bluffs here are composed of the usual yellow clay, and contain very little sand. On the northeast corner of the NW. ¼ of the SE. ¼ Sec. 5 are three common round mounds, standing in a triangular position to each other, with the largest to the north, the next in size directly south of it, and the smallest to the east.

On or near the southwest corner of Sec. 4, T. 11 N. of the base line 5, east of the fourth principal meridian, are a series of common round and long mounds of more importance than any yet discovered in this part of Illinois. Commencing at a point near the foot of a long bluff and sloping to the south 40 rods north of the south line of Sec. 4, and 10 rods east of the west line, are three common round mounds. For convenience we have numbered these mounds commencing with the most westerly. (The distance is from center to center of round mounds, and from end to end of long mounds.)

From 1 to 2 is 39 feet from center to center; from 2 to 3 is 30 feet from center to center; from 3 to 4 is 50 feet from center to center.

This mound, 80 feet long, with a cross at the end of 33 feet in length, is 2 feet high. The cross is 10 feet wide. The main or principal mound is 15 feet wide. From No. 4 to No. 5 is 123 feet. No. 5 is a common round mound 3 feet high, with a base diameter of 40 feet. From No. 5 to No. 6 is 53 feet. No. 6 is 98 feet long, 2 feet high, 18 feet wide, with the greatest length from southwest to northeast. From No. 6 to No. 7 is 75 feet, west-northwest of No. 6. No. 7 is 104 feet long, 2½ feet high, and 18 feet wide, with the greatest length from southwest to northeast. From No. 7 to No. 8 is 100 feet. No. 8 is 140 feet long, 3 feet high, and 20 feet wide. Fifty feet from the south end of this mound is a black-oak tree 3 feet in diameter, and standing in the middle of the mound. This mound is 100 feet west of the bluff of Spoon River. The bluff is 40 feet in height at this place and very precipitous.

In company with Mr. W. J. Morris, I made a cross-cut in this mound to the original soil. At every spadeful we would bring up flint chips, and we found several pieces of trap-rock, some of them polished on one side. In accordance with the usual rule here, of computing sixteen growths to the inch, I measured on one side of the center of the tree. (This is the rule here for black oak.) Around the mound when the leaves are off are great quantities of flint chips.

We made a slight examination of Nos. 6 and 7, and found nothing excepting traces of ashes and charcoal. On opening No. 3, at a depth of 2 feet I found ashes, at 2½ feet, 6 to 8 inches of charcoal and ashes, at 3 feet hard-packed earth. At 3 feet 3 inches I found two skeletons with all the bones very much decayed excepting the teeth, and these were not worn by the owner for probably thirty years. I opened 2 and 1 and found nothing. All the mounds have the appearance of having been built at the same time and by the same people. Spoon River at this point is 100 feet wide. I found no depressions from whence the material of which these mounds are built was taken.

ANCIENT RELICS AT DAYTON, OHIO.

By Aug. A. Foerste, *of Dayton Ohio.*

The country west of Dayton is subject to inundation on the part of the Miami River during the spring freshets. The city recently constructed levees to protect the land within its corporation, which includes some corn-fields extending for a mile along the west bank of the river. For this entire distance, the construction of the levee necessitated the removal of about 2 feet of the surface earth for quite a distance on either side of the embankment. Fragments of pottery were here found by Mr. Chester Kiehl, and were readily identified as being Indian work. This gentleman invited a few acquaintances to assist him in his excavation, which led to some interesting results.

The pottery was found at an almost uniform distance of 3 feet beneath the original surface of the earth, associated with the bones of the buffalo, the deer, and the elk, known to have been common in this valley. Several human skeletons have also been found, which, at first, led to the belief that a burial-ground had been discovered, but the following facts induce an opposite opinion: The heaps of ashes were found at a uniform depth, and usually contained the pottery, which was mostly in fragments. The skeletons were found at the same depth, but were extremely few in number when compared with the number of ash-piles and pottery and implements found in their vicinity, since the latter would necessarily fall under the head of articles buried with the dead to be of use in the other world; however, there were too many relics, too scattered, to appear to have been buried there. This was probably an ancient village, the tribe of which perished or left, and the place was afterwards covered by the heavy sediment of the river during inundation. The skeletons are probably those of a later race buried here, or those of the old inhabitants whose bodies remained on the ground after some great warfare.

The removal of earth for the levee considerably lightened the labor of excavation, and resulted in the finding of more relics than would otherwise have been attainable. Some idea of their antiquity may be gained by learning that they were found 2 feet beneath the surface and that more than 2 feet must be added to this depth to make allowance for the removal of earth for the neighboring levees.

A large number of mussel shells, belonging to the species of *Unio verrucosus*, Barnes, were found with holes cut into shell, large enough for the introduction of a finger. The valves in this condition were probably used as earth and sand scrapers, taking the place of shovels, probably also as skin scrapers, for which they are adapted. Placing the finger through the hole, and the back of the valve against the palm of the hand, it can be held with ease and firmness. Some of the scrapers had become calcined by exposure to fire, and were found in an imperfect condition throughout the ash layer.

The carapax of the lady turtle, *Chrysemys marginata*, was found in several instances, the plastron having been removed. In this condition it could be used as a drinking cup, the handsome green color variegated with yellow and red making it a pretty object. Near Cincinnati, the shell of this turtle has been found pierced by two holes, which undoubtedly enabled the Indian to use it as a pretty, although cumbersome, ornament.

A few arrow-heads made of chert were either triangular in shape or of an elongated form arising from a square base. They are made of a chert common at Flint Ridge, in the southeastern part of Licking County. This station, belonging to the lower coal-measures of the Carboniferous period, consists of a layer of limestone containing many quartz crystals and nodules of chert. The latter were sought by the Indians far and wide, who came to this station and mined for the chert, employing it for their arrow and spear heads. Holes and excavations still exist, pointing back to a time when this was the common center, for hundreds of miles, of the Indians hordes, intent on the material so useful in gaining their sustenance and asserting their sway among the native tribes. It was therefore not an unexpected discovery to find that the arrow heads above mentioned belonged to the same class of cherts as those found at Flint Ridge.

A few of the bone implements commonly in use by the Indian tribes were found. One of the heavy implements made from elk antlers, usually called awls, had the larger extremity hollowed out for a distance of about 2 inches, and four holes were drilled into this end from opposite sides, so that the instruments could be conveniently fastened, by means of a thong, to a belt or to the wrist. If this instrument, 10 inches long, with a coarse point, was indeed used as an awl, another implement of bone, of the same length, but long, narrow, and quite flat, showing at one end that it had once been longer as well as pierced, may have formed the needle by means of which the hide was sewed together after the awl had done its work. This needle was evidently made from the rib of some animal. Another piece of bone, pointed at one end, may be called an awl or an eyeless needle. It was only 2 inches long. A fractured bone, pointed at one end and about 4½ inches long, could scarcely have been anything but an awl. Quite a singular implement, made of an antler point, rounded and smoothed as well as hollowed out at the larger extremity, is without doubt an arrow-point, and the points are found in Ohio of any size between 1 and 4 inches. This suggested the idea that although the pointed instruments made from elk antlers are ordinarily to be considered as awls, the peculiar specimen above described may have been used as a spear-head, the holes being useful in fastening it to the spear-shaft.

Marginella apicina, a marine shell, found only in the Gulf of Mexico and the neighboring Atlantic, was found about the neck of one of the skeletons. About thirty of these handsome little shells were picked up which had once formed a necklace in connection with some shell beads immediately to be described. The *marginellas* had been pierced by rubbing the apex of the shell obliquely on some stone until the chambers of the shell were exposed, after which they could be readily threaded.

The rest of the shell beads show more artistic skill. They are small, round, and made from some larger shells, probably the common *unios* of the river. The largest were only one-eighth of an inch large, and the smallest about one-tenth of an inch. Of these beads about one hundred and seventy-five were found. They were generally flat at the ends, the plates of shell structure extending lengthwise, the sides were either imperfectly cylindrical or a slight attempt was made toward rounding them off as in modern glass beads. The interesting feature is the manner in which the holes are drilled. They consist of two concave openings, one from each end, having the opening towards the center of each bead, the narrowest diameter showing that the holes were drilled from both sides, the openings meeting in the center. If the hole had been drilled from one side alone the form of the opening would have been that of a hole large at one end and smaller at the other.

The only Indian skull which was at all well preserved presented the ordinary features of an Indian head. It had a flattening of the occiput on the left side of the head, in which it differs from ordinary cases of compression where the flattening is regular and exactly on the back of the head, not towards either side. Skull flattening is now known to be a common practice among the lower types of men; it is even practiced at present near Marseilles, in France,* where it is probably a relic of barbarism dating back to the Huns, who themselves obtained it from an Asiatic source. The practice is said to be of Mongolian origin, and is mentioned by early Greek and Roman authors. The flattening in the present instance was caused by the cradle-board, to which the Indian in his infancy, while his skull was still soft, had been tied. The pressure of the hard board upon the soft head caused the flattening. The cradle-board is a well-known factor in the Indian's life, and is frequent in illustration of the Indian squaw with her dusky pappoose.

The pottery fragments were quite abundant, especially so in the ashes and in their immediate vicinity. The pieces seemed rarely to belong together, and no entire pots were found, which would lead to the inference that the fragments were the remains of pots accidentally broken, the larger pieces being thrown away, the smaller ones remaining in the ashes, so that the broken pieces can rarely be restored. The pottery of Indians is well known to have been the work of their women. Its quality varied considerably, but in general it may be said to have become ruder in proportion to the distance of the tribes from Central America, the great aboriginal art center. Ohio art is of quite a low character, ornamentation being usually restricted to simple geometrical figures consisting of parallel lines, either straight or curved, which meet each other at various angles. The vast majority received no ornamentation whatever, and attempts at figures, human or of animals, are exceedingly rare. No attempts at glazing were made; in a few specimens a gloss is found, due to vitrifaction of the silicious element contained in the clay used. No attempt at coloring is apparent, the variation of color being due to the soil and materials used, and accidental rather than intentional. The colors are confined to red, caused by oxides of iron; grayish-white, due to the use of "blue clay"; and a very dark brown, the clay not being pure, but mingled with vegetable materials.

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* Smithsonian Report, 1859.

The custom of burial in vases seems not to have been practiced by the Ohio savage, so that the pottery all belongs to the *akeek* type. The *akeek* is a vessel rounded at the base and destined for use as a sand bath, being placed in the heated sand and ashes, over which a fire had previously been kindled. The *akeek* had, therefore, no use for legs, and did not receive any. The edge of the pots generally flared out a little, but, to aid the Indian in removing his akeek, he thickened the lips at various parts of the circumference and allowed it to project a little; this served as a handle. The large and coarser pottery, destined to be hung over a continued fire, was pierced by holes not far from the edge, generally two holes a few inches apart, accompanied by a similar set on the opposite side. In some cases little handles are attached near the lip of the pot, through which cords might be passed. Usually these are four in number and are placed at equal distances on the edge of the *akeek.* In this manner the *akeeks* were readily suspended from the apex of a tripod formed by branches of trees. In vessels not intended for suspension these handles are reduced to one or two, which allow a passage of the finger through the ring formed by the handle. In those destined for suspension, the handles as well as the holes usually do not readily admit the passage of a finger, these having evidently been designed only for cords. The necks of all these pots are contracted; many necks end with this contraction, but most of them flare out again into something of a lip. A very unique pot, or drinking cup, of the former type was found with a depth of about 3¼ inches, which contracted at the mouth to only 2½ inches. Its average thickness was about five-sixteenths of an inch, but in order to form the lip the edge had been thinned out by pressure between the edge of the fingers until it was only two-sixteenths of an inch in thickness. The finger marks are still visible. In some cases no attempt at a distinct lip was made, the edge of the pot being merely smoothed and rounded off. The height in civilization reached by the Indians here concerned, however, seemed to require at least a *rim* to his pot, even if all other ornamentations failed. This was formed by doubling back the edge of the pot for a short distance so that it formed a somewhat broad ring about the upper edge of the pot. This was either left plain or ornamented with the rest of the vessel.

Ornamentations are usually plain, and even the most elaborate works show but little knowledge of proportion in drawing. It may be divided into incidental and intentional. The incidental art, although not evincing any skill on the part of the Indian as far as artistic matters are concerned, was none the less effective, and led to a principle in their art which showed considerable taste. I refer to the matter of relief. The Indian without the aid of a potter's wheel, and relying mainly upon his hands as a potter, took recourse to many a device to form his clay. Common in the south was the molding of his work over a gourd and then burning out the gourd by means of fire. In the north the clay was often molded in a bag made from the coarse fibers of some plant, probably from the fibrous bark of some tree. On burning the vessels impressions were left of the bag, sometimes even of the nature of its woof. In a fine specimen found at our diggings even the individual fibers have left their impress; on the other hand a piece found about 7 miles away, in a southeasterly direction, along the same river, shows very plainly a series of parallel threads a short distance apart, crossed vertically by an abundance of threads which are placed side by side. This is the plan of some "mound builder's" cloth found in the same neighborhood, and illustrates the manner of work. Baskets of willow and of wood splinters are said to have been used. Some few pieces of pottery found with the rest may have been molded in this manner, but the impressions left are not plain enough to determine this with certainty. On the other hand bark impressions are very common, some of which might possibly belong to bark-basket work, but a careful study makes me believe that most of the bark impressions were made in order to make the pot look more beautiful than it would with a plain surface. Basket work would require that the impressions should occasionally cross each other, which they rarely do. Again, these impressions commonly appear about the necks of pots, a place which derives its shape from the hand, as may be seen from the delicate curves there necessary, at least in the finer pots, and it would be too much to assign this delicateness to the forming baskets, especially as the neck is generally smooth, owing, no doubt, to contact with the fingers while the neck was being molded. Again, the bark marks appear on the rim of the vessels, a place usually formed, not in contact with the basket, if there be any, but by the fingers.

The edge of the vessel, according to modern notions of pottery, is fashioned last, and after the neck has been contracted. After the edge is turned over to form the rim, the inside surface thus exposed forming the rim on the outside, should manifestly have no back markings, but the contrary is the case. Again, the handle, fashioned by hand and afterward stuck on, often has bark markings on the outside of the curve, sometimes within. I have been thus explicit in order to show that much of this bark-marking is a matter of art, not of accident, and that the object was the beautifying of the pot. At any rate, a specimen was found in which an attempt of bark imitation was made by means of some sharp-pointed instrument, which made the surface look more handsome than a mere bark impression would have done. The lines of this instrument intersect each other at angles impossible in bark impressions of the character here represented.

The idea of relief having once been gained, it could readily be applied in other ways, the most successful being the work on the pots found at La Porte, Ind., in which a relief is produced by the punches of a square-pointed stick; against this the lines, curved and of various pattern, stand out more beautiful by far than if cut on a plain surface. The idea of bark impressions which led to their use as a matter of relief, did not forbid the drawing of figures on a plain surface when taste seemed to require it.

The geometrical figures on pots are mostly confined to the neck and its border or rim. In many cases a mere stick may have been used to cut in the lines, but in the best work the clay seems to have been gouged out by some pointed instrument, probably by a pointed bone which had first been fractured so as to expose the hollow interior, and then smoothed down so as to leave a groove at the end. A hollow stick was also effectively used to make small circular dots by way of ornament; these often left a little elevation in the hole, owing to the softness of the pith. The figures themselves may readily be reduced to a few simple plans as far as pots discovered near Dayton were concerned. A common form is to have various oblique lines met by other oblique lines at an angle usually not far from 90 degrees. Another figure was to have a series of parallel wavy lines crossed by others of the same character. The use of a single wavy line is very rare, and in the case discovered was accompanied by a series of dots. The ornaments of the border are somewhat similar, allowing also a very effective one, made by pressing a stick obliquely against the edge of the rim, as many ladies ornament their pies. The dots made as described above were placed wherever they were thought to be effective, and often without any particular arrangement. Little more can be said of this pottery, excepting that the clay was mingled with fine gravel-sand, pounded quartz rocks, pounded gneiss, containing abundance of mica, more rarely with pounded shells. This practice is well known to have been done with a desire to prevent cracking and fracturage during the baking process. The finest and thinnest pottery is about one-eighth of an inch thick, and contains only fine particles; the coarsest and thickest pottery is often one-half of an inch thick, and contains coarse pieces of quartz, sometimes an eighth of an inch to three-sixteenths in diameter.

MOUNDS IN BUTLER COUNTY, OHIO.

By J. P. MacLean, *of Hamilton, Ohio.*

Butler County, Ohio, is situated in the southwestern part of the State, and joins the State of Indiana. Through it passes the Great Miami River in a southerly direction. It contains numerous remains of that people known as the "Mound Builders," among which are not less than two hundred mounds, varying in height from 18 inches to 43 feet.

These mounds and the general surface of the country have afforded not less than two hundred thousand implements belonging to pre-historic times, and every succeeding year adds to the number. When it is considered that the county contains but 291,000 acres, including waste land caused by streams and wood-land, the yield of implements must be regarded as remarkable. The plow turns up a vast number every year, as though the supply was undiminished.

The tumuli, located on the second and third river terraces, have never been systematically explored. The plow has been instrumental in turning out many relics from the mounds, and curiosity-seekers have obtained many specimens by digging into them, but without taking note of the layers forming the tumuli. Most of the relics have been taken near the surface of the mound, and consist of arrow and spear heads, axes, pestles, mortars, pottery, &c. A mound* situated in Fairfield Township was partially taken down; and in removing the earth there was found a thin copper breast plate,† 5¼ inches long, and 3⅝ inches wide at one end, and 4⅛ inches at the other. Near the center are two perforations an inch apart, broader on one side than on the other. The implement was hammered out cold. One side is partially covered with verdigris. From one of the three mounds on the commanding hill in section 9, Saint Clair Township, there was plowed up, in 1855, four copper hatchets, 6 to 9 inches long, and 4 to 2 inches wide. From a mound (location not now known) James McBride procured the representation of the head of a bird,‡ somewhat resembling the toucan. It was made out of clay, and seemed originally to have been attached to some vessel.

A few of the mounds have been entirely removed and the contents noted. In grading for the Cincinnati, Hamilton and Dayton Railroad, it was found necessary to cut through the large mound in section 11, Madison Township. This mound was not only cut in two through the center, but the grade of the road-bed went below the original surface of the ground. At the bottom of this tumulus and under the apex were found human bones and chest implements. With the bones was found cloth. The cloth had the appearance of having enveloped the skeleton. The fabric was composed of some material allied to hemp, and the separation between the fiber and the wood was as thorough as at this day by the process of rotting and hackling. During the year 1881 I examined some of this cloth, then in the possession of Thomas Doner, a druggist, of Dayton, Ohio. I found the thread to be coarse, uniform in size, and regularly spun. In grading for a roadway in Wayne Township, it was found necessary to cut away the greater portion of a mound in section 24. At the base of the mound occurred a human skeleton in an extended position. Lying upon the chest of the skeleton was a spear-head, composed of blue chert, nearly 6 inches in length and 2 inches in width just below the barbs, the whole being symmetrical. Mr. Richard Brown removed a mound in Ross Township, and beneath the mound and under the original surface of the ground he found a badge of authority* composed of cannel-coal. It is perfectly symmetrical and finely finished. The two wings are divided into halves by a ridge extending the whole length of the implement. At the corners of the wings are knobs. At the center it is narrow, thick, and arched, but broad at the wings; the extreme length being 8¼ inches and the greatest width 3⅞ inches. Near the center are two perforations 1¼ inches apart, the greater diameter of the perforations being on the under side.

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*Ancient monuments of the Mississippi Valley, Plate xxx, No. 1.

†Figured in "Mound Builders," page 164.

‡Ancient monuments, page 194.

Many skeletons have been taken from the mounds. In some cases several have been found together, forming a circle, the crania being at the center. The cranium taken from an ash-pit in a mound in Liberty Township fell into my possession, and in due time I presented it to the Smithsonian Institution. It was in a perfect state of preservation, and exhibited all the characteristics constituting Indian crania.

Under the direction of the Smithsonian Institution, I undertook the examination of some of the tumuli during the summer of 1883. The first to examine was the group located on Sec. 21, Ross Township. This group is figured in "Ancient Monuments," page 170. Although I had visited this group on a previous occasion, I had yet never examined them carefully until July 25, 1883, when, in company with Hon. W. H. Harr, judge of probate, I commenced an exploration. The mounds as represented in "Ancient Monuments" are not as we found them. We noticed that *f*, *e*, and *d* (see Fig. 1), are still to be seen, although *f* has been plowed down; but as the composition of the mound is different from the surrounding surface it is plainly visible. As to *b* and *c* there is no trace whatever. The soil gives not the least indication that there had ever been there two mounds. If composed of either clay or ashes or both, it would seem that some trace would be left. Years of cultivation would as easily have obliterated *f* as *b* and *c*. There is no just reason why *g* and *h* should have been left out of the plan, for evidently they constitute a part of the group. When surveyed originally the five small mounds surrounding the large one ranged from 4 to 10 feet in height; the largest of the five would now hardly reach 4 feet. The mound *g* is 449 feet easterly south of the largest of the group, and has an altitude of 7 feet, by 65 feet diameter at the base. At a distance of 220 feet southeast of *g* is the mound *h*, 6 feet high by 50 feet diameter at the base.

This group is located 6 miles southwest of Hamilton, on an irregular tract of land, constituting the highest point in the township. Declivities present themselves on every side. The largest mound of the group is 26 feet high, and from its summit a fine view, extending many miles in every direction of the surrounding country can be obtained. About the year 1820 a shaft was sunk into this mound by treasure-seekers, in hopes to find a chest of money. The tunnel was started on the north side about half way up the slope, and ran downwards at an angle of thirty-five degrees for a distance of 30 feet, when the center was reached, from which point it was carried eastwardly several feet. It was related at the time of the excavation that the center gave the appearance of having once been a hut formed of leaning timbers. Within this vault were found a stone back-wall, coals, ashes, and human bones. The mound is now being removed in order to make fills in the field. The material is being taken from the east side. At this point is a perpendicular side of 10 feet. The explored earth shows a large percentage of ashes, the face having a whitish color.

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* Figured in "Mound Builders," page 167.

After taking a complete survey of the mounds we concluded to open mound *e*. Into it we dug a trench 32 feet long and 3 feet wide, and sinking it to the original surface or undisturbed earth. We commenced at the east side and ran the drift west, bearing a little to the south. Six inches below the surface of the mound we struck a bed of fine ashes. At the southwest side we came upon a circular bed of ashes 44 inches in depth. Within this bed and irregularly distributed were small pieces of charcoal and occasional small burned limestone pebbles. Near the bottom of the bed, or 50 inches below the apex of the mound, were two separate pieces of fire-baked clay, both of which appeared to be regular in shape but were destroyed by the pick. One of them had been regularly bored, the aperture not extending through, and pointing at the bottom as though bored by some large gimlet. Near by was a burnt limestone 6 inches wide, 7 long, and one-half thick. No other stones, save pebbles, were seen. That this mound had never been opened before was witnessed by the innumerable traces of roots which we saw everywhere in the trench.

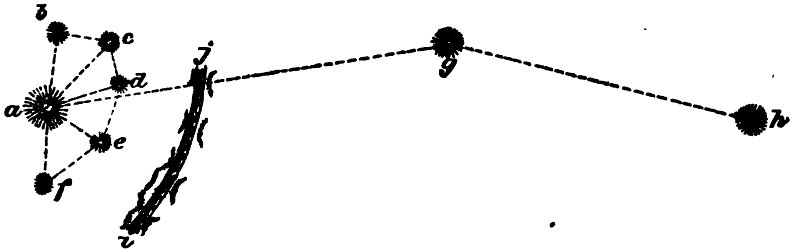

FIG. 1.—Group of Mounds, Ross Township, Ohio.

The mounds *g* and *h* presented evidence that they had been recently opened. Upon inquiry we learned that they had been excavated during the fall of 1882. No relics were taken from either mound. Below the apex, and upon the original surface of the ground, occurred in each an altar, composed of stone, 3 feet in diameter and circular in form, with a depression in the center. In the center of the altar of *g* was a large broken bowlder, covered by a layer of fine ashes. Within this bed of ashes was a large charred piece of wood.

A ditch, *j i*, is easily traced, which seems to have escaped all previous observers. Whether it was the intention to carry this ditch around the cluster of mounds, or was simply a depression left after excavating for the earth in order to construct the mounds, it would be difficult to tell. Between the mounds *e* and *g* there is quite a depression extending from the northeast to the southwest, as though it had been purposely hollowed out. The ditch does not seem to be accidental, for it is not only placed a little above the deepest part of the depression but its curve is regular. It might be fair to conclude that the ditch was an afterthought, and it was the final intention to carry a circular wall around the group, excluding *g* and *h*.

In Ancient Monuments of the Mississippi Valley, Plate xi, Fig. 3, is a representation of an earthwork washed by the Great Miami, a description of which occurs on page 30. In the diagram is a mound marked "10 feet high." On the 7th and 8th days of August, 1883, with sufficient help, I opened this mound. A general survey of the inclosure shows it to be rolling, with prominent knolls here and there. The whole field was matted with a very heavy growth of clover. The land is exceedingly fertile. From the productions of this one field, a large family of children was brought to the years of maturity. The soil is black loam mixed with sand. At almost any point fragments of pottery may be picked up. This pottery is composed of burnt clay intermingled with crushed fragments of the shell of the *unio*.

The mound does not lie in the place it is put in Ancient Monuments, but is farther removed from the river. The excavation was commenced from the north side at the point *y* (Fig. 2), and carried to the bottom of the mound *d*. The trench is 35 feet long, 4 wide, and at the center of the structure 9 feet deep. Before commencing the mound proper, the builders scooped away the earth, forming it in the manner of a basin. Immediately upon this basin was placed a layer of sand containing charcoal. Over this was placed a layer of charred bark 1 inch in thickness. The fiber of the bark was very coarse, and in places

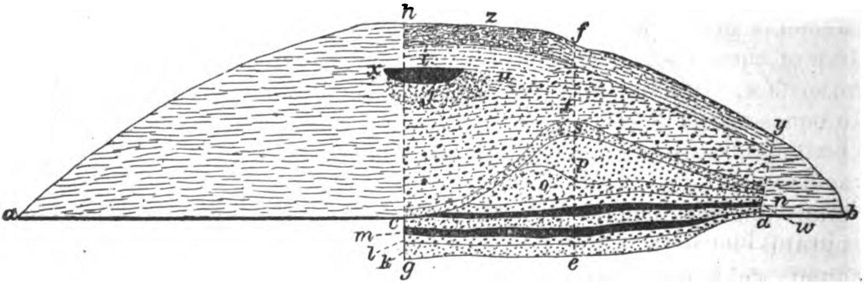

FIG. 2.—Mound in Fort, Ross Township, Ohio.

gave evidence that large sheets had been peeled from the tree, then charred, and, unfolded, spread upon the previous layer. The charred bark was continuous, though not extending out as far as *d*. This charred bark was found to be rotten. The first measurements were taken at *f e*, the depth of the trench at this point being 8 feet, the point being removed from the place of beginning 17½ feet. Upon the layer of charred bark was one composed of fine charcoal and sand 6 inches thick, *c*. Over that was placed a layer of charcoal 1 inch thick. Overlaying that was a deposit of fine-grained sand 4 inches thick, which in turn was covered by a layer of sand and ashes, *o*, 7 inches deep. Thence a deposit of sand 16 inches thick, *p*, over which was a layer of ashes 2 inches deep, *s*. Upon this was a formation of ashes intermingled with sand 30 inches deep. Over all was a layer of made soil more or less mixed with sand.'

From *h* to *f* as we descended careful observations were taken. Upon the top of the mound and extending through the layer of made soil were loose limestone, some of which were as large as one man would wish to handle. All showed evidences of fire. The next course was composed of ashes containing both soil and sand, *u*. Within this formation was the altar *i*, composed of burnt limestone 3 feet in diameter and circular in form. Upon this altar were charred fragments of the horn of a deer. Other bones of the deer also occurred, none of which had been split open. With these remains were a fragment of pottery and an implement made of bone and one of horn, the last being charred. Some of the stone had been so thoroughly burned as to break in pieces on being lifted from the bed. Immediately below the altar was a layer, *j*, of red and matted ashes. From this point and extending to the bottom, and resting upon a layer, *s*, of ashes was a bed of ashes mixed with charcoal and sand. At various points in the excavation occurred fragments of bowlder, which had been broken after being polished. More of these fragments occurred near the center and bottom than at the surface. Similar fragments may be picked up in the adjoining field. No bones occurred elsewhere than on the altar, save in one instance. About eight years ago a relic hunter took out a human skull at *x*. What was done with it, or what were its characteristics I was unable to learn.

The walls of the inclosure, within which is the above mound, removes a natural elevation, which has been taken for a tumulus. It is a gravel mound, and belongs to the drift period. From the apex of this elevation some twenty years ago, were taken five human skeletons. The skeletons radiated from a center, the heads forming the inner circle. The remains were in a good state of preservation. No one took pains to secure them.

It might be well to notice, in order to be of service to investigators in other departments, that we saw clover roots extending into the mound perpendicularly a distance of three feet. Also 7 feet below the apex of the mound we saw a nest containing the common brown ant.

The next objective point was a mound close to a fort* on section 12, Ross Township, marked *a* in Fig. 3. This mound was examined on August 14, 1883. It is located 400 feet south of the gateway *E*, and is semi-circular in form, the concave part facing east. It is 70 feet long and 32 feet wide at the base. Its summit is 30 feet long and 12 feet wide. Until quite recently it was covered with forest trees, but not of large growth. At the northern extremity I sunk a trench at *c d* (Fig. 4), and ran it into the mound in a southerly direction a distance of 16 feet. At *h n* the depth was 5 feet. In the work we were constantly impeded by roots and masses of rootlets that everywhere occurred. The mound was covered by clay and compact soil to a depth of 2 feet. Under this was a layer of burnt limestone irregularly placed together. Under the limestone we came upon at *a* a portion of a human skeleton, imbedded in the layer or bed of ashes marked *k*. The skeleton was in an extended position, the feet pointing toward the northwest. It appeared to be lying partially on the right side, with the left arm thrown over the body. I worked with great care in order to obtain these bones whole, using my pen-knife entirely in lifting them from the bed, but succeeded only in obtaining the right humerus entire. The left femur had been broken off near the lower extremity.

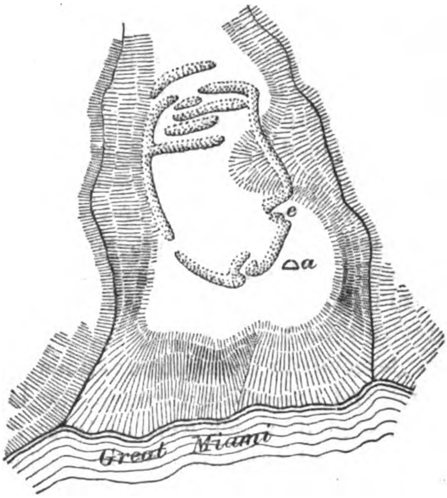

FIG. 3.—Fortified hill, Butler County, Ohio.

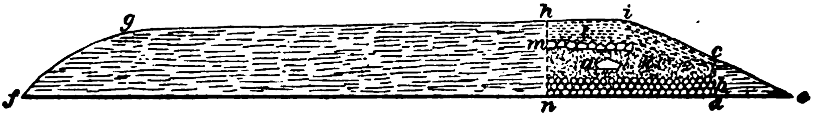

FIG. 4.—Mound on fortified hill, Ross Township, Ohio.

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* Ancient Monuments, Plate vii.

The bones secured were the femora humeri, the left radius, pelvis, and fragments of ribs. No cranium or backbone could be found. None of the bones would admit of scientific investigation, save the right humerus and left radius. The former is 12⅜ inches in extreme length.

Under the ash-bed were three layers of partially burned limestone, the three layers being 15 inches thick. The stone was regularly put together having the edges to fit so that no break appeared. Nothing occurred between the three layers. The bottom layer was placed upon the original surface of the ground. The stone was of good quality and still could be used for building purposes.

OTHER EXPLORATIONS.

I personally opened three mounds in Franklin Township, Warren County, Ohio. One of these occurred on section 23, northwest quarter, on the land of James McLane. The mound is removed 2½ miles from the Great Miami and located on the side of the rise of ground from the second to the third river terrace. It has a commanding view of the country to the northwest, and from which a light on the great mound at Miamisburg could be seen. The mound, to my certain knowledge, has been plowed over for the last twenty-nine years. It is low, and covered with a clayey soil mixed with sand. The apex is not over 2 feet above the general surface. Under the made land I struck an ash-bed 3 feet thick, considerably mixed with charcoal. In this bed I found a barbed spear-head, 3 inches long, made out of a bluish-gray chert.

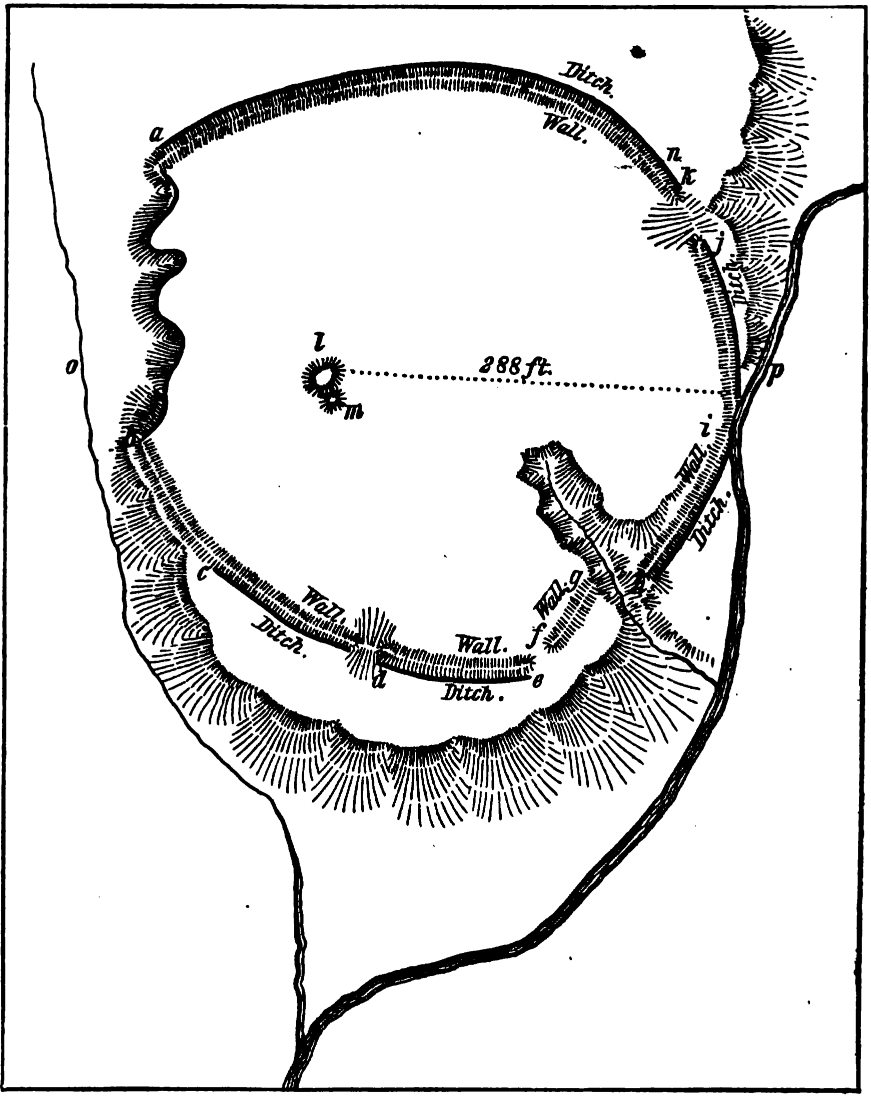
On the southwest quarter, section 22, on the land of George McLean, between the Franklin and Red River turnpike and the township line, are two mounds, one 6 feet and the other 4 feet in height. Both of these I opened, but in each was only an unstratified ash-bed, mixed with charcoal.

The three mounds above described are isolated. There is no evidence that they were used either for signal or sepulchral mounds. From the two latter a good view of the country in any direction could be obtained, although located upon the third river terrace. Had they been placed one-sixteenth of a mile farther north, a commanding view of the Great Miami River would have been obtained.

AN EARTH-WORK IN HIGHLAND COUNTY, OHIO.

By J. P. MacLean, *of Hamilton, Ohio.*

In company with Lafayette Ferris, on the 21st of July, 1883, I made a survey of an inclosure in Salem Township, Highland County, Ohio, located 1½ miles southwest of the village of Pricetown. It is covered with forest trees of the same variety and growth as those found in the immediate vicinity. On top of the embankment, at the point *n* in the figure, is a beech tree, measuring 10 feet in circumference at 3 feet above the ground. On the larger mound, *l*, is a decayed stump of what was once a large tree. From *a* to *b*, in a straight line, is a distance of 447 feet. Along this side of the inclosure is no artificial elevation.



Sketch of earth-work in Highland County, Ohio.

The small stream *o* once washed against this side and formed an irregular embankment 12 feet high, with a steep declivity. From *b* to *c* the artificial embankment skirts along the brow of the hill, has no accompanying ditch, and extends a distance of 192 feet. On the exterior of the embankment, from *c* to *d*, is a ditch 312 feet long. At *d* is a wash which has taken place since the work was abandoned. From *d* to *e* is a distance of 192 feet. The wall *f–g* is removed inwards, owing to the irregularity of the land. It is 48 feet long and has no accompanying ditch. The gateway *e–f* is 25 feet wide, and that at *g–h*, 64 feet. At the latter gateway the land rapidly descends, and there is a small stream passing through it. That this is not a washout is proved by the fact that the wall *h–i* with its accompanying ditch, extends down the declivity a distance of 14 feet. This would also show that the depression, for the most part, was there at the time when the wall was constructed. From *h* to *j*, is a distance of 424 feet. At *i* the stream *p* has encroached upon the wall, carrying a portion of it for a distance of 15 feet. The stream at this point is 32 feet below the embankment, presenting a perpendicular face, and is still encroaching upon the inclosure. At *j–k* is another washout. From *k* to *a* is a distance of 480 feet. The entire embankment has an average height of 3 feet and a base 24 feet in width. The accompanying ditch is 16 feet wide, with an average depth of 14 inches. At a distance of 288 feet from *i* is the large mound *l*, 6 feet in height and 60 feet in diameter at the base. It is encroached upon by the small mound *m*, 4 feet high and 42 feet in diameter at the base. The former has been partially opened, but no relics have been discovered.

MOUNDS IN BERRIEN COUNTY, GEORGIA.

By William J. Taylor, *of Alapaha, Ga.*

The Alapaha mound is situated 5 miles northeast of the town of Alapaha, on Alapaha River, on lot of land No. 328, fifth district of Berrien County, Georgia. It is 38 feet across, 6 feet above the level, and somewhat oval in shape. In the center of the mound was a burial vault 6 feet deep, 3 feet wide, and 6 feet long, north and south. Two bodies were deposited in this vault with the heads pointing south. From the appearance at the time of exploration the bodies had been deposited in the vault and then covered up with a large quantity of ashes and pine coals. The bones were very much decayed, and no implements were found with them.

The Withlacoochee mound is situated 5 miles south of Nashville, on lot of land 278, in the tenth district of Berrien County. The dimensions are 18 feet base diameter and 3 feet in depth. No relics were found in this mound, and even the bones were so far decayed that it was impossible to tell the mode of burial.

Reedy Creek mound is situated 10 miles northeast of the town of Alapaha, on Reedy Creek, on lot of land No. 24, in the fifth district of

Berrien County. There was a vault, or dug hole, 5 feet long, 3 feet wide, and 1½ feet deep in the center of the mound, in which the bodies were burnt and afterwards covered. On this covering was a burnt mass 3 feet deep and 20 feet in diameter. This had been covered up and the burning process repeated. The dimensions of the mound were 48 feet base diameter, and 6 feet in depth. No relics were found.

The French Ferry mound is situated on lot of land No. 415, in the tenth district of Berrien County, 10 miles south of Nashville, 7 miles southeast of Adell post-office. These two mounds are 1 mile down the river from the ferry, in a red-oak thicket, on a hillside facing south. The earth for the structure was obtained 30 yards diagonally up the hill. The work was built around a pine stump. No. 1 is of yellow sand mixed with gravel and rock. In the middle was a mass of charcoal mixed with the earth. No relics were found.

MOUNDS AND SHELL HEAPS ON THE WEST COAST OF FLORIDA.

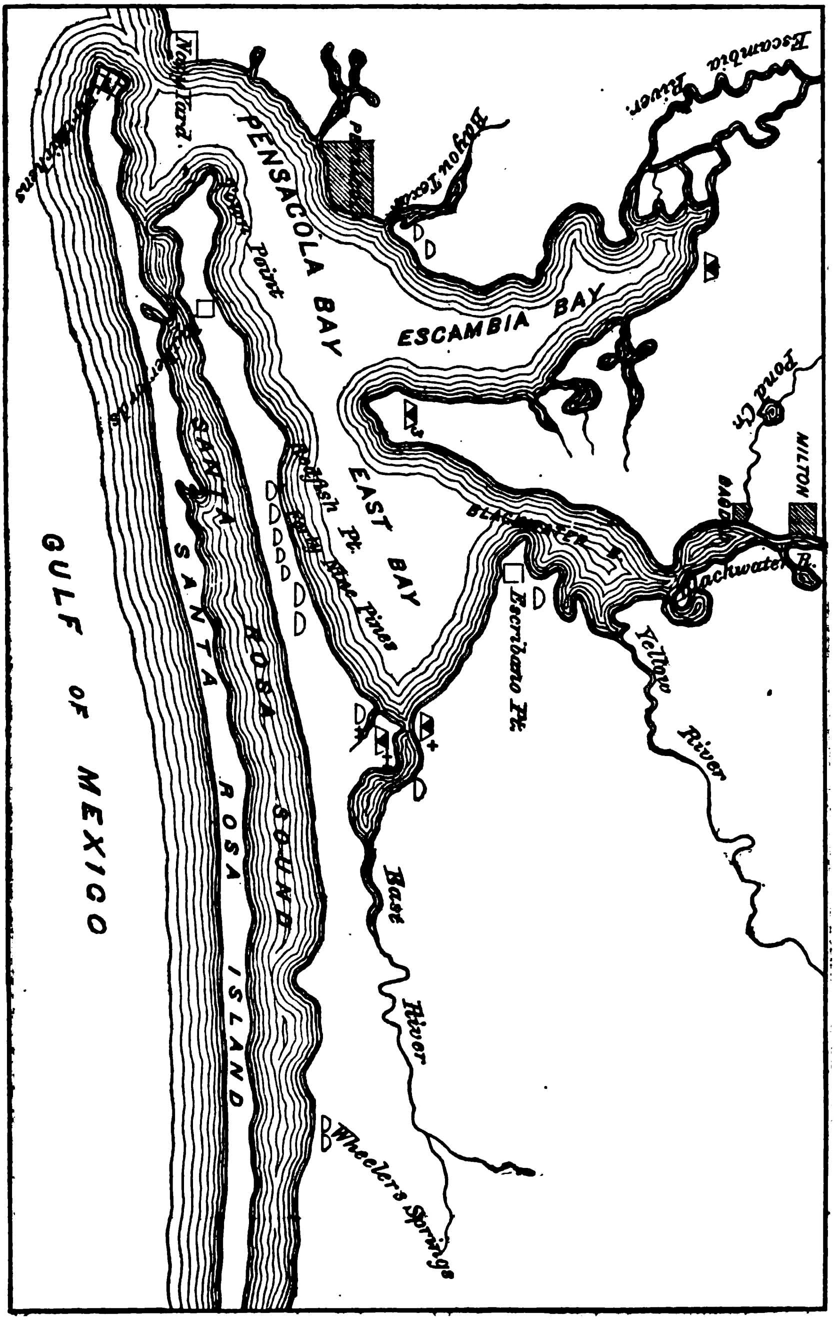
By S. T. Walker, *of Milton Fla.*

During the past two years the explorations of the mounds and shell heaps on the western coast of Florida have been continued, and many of the principal remains left by the aborigines between Hillsborough County on the south and Pensacola Bay on the west have been located, thus connecting the work with that done in 1879, a full report of which may be found in the Smithsonian Report for that year. These explorations were necessarily confined to the coast lines, or to such points as could be reached by the rivers. In no case, however, were they pushed very far above the influence of the tide.

On the accompanying map of Pensacola Bay and vicinity (Map 1) all the principal mounds and shell heaps may be seen at a glance. The mounds are generally quite small and were nearly all erected for domiciliary purposes. The shell heaps are also small in comparison with those of Tampa Bay. The long residence of white men in this portion of the State has tended to obliterate all traces of aboriginal occupancy except the larger mounds and shell heaps, and, besides these, but little remains of their works excepting an occasional arrow-head or a fragment of broken pottery. This is especially the case in the immediate neighborhood of Warrington and Pensacola.

It is probable that there was a large Indian population around the northern end of Escambia Bay and about the mouth of Escambia River, as many relics have been obtained in that region.

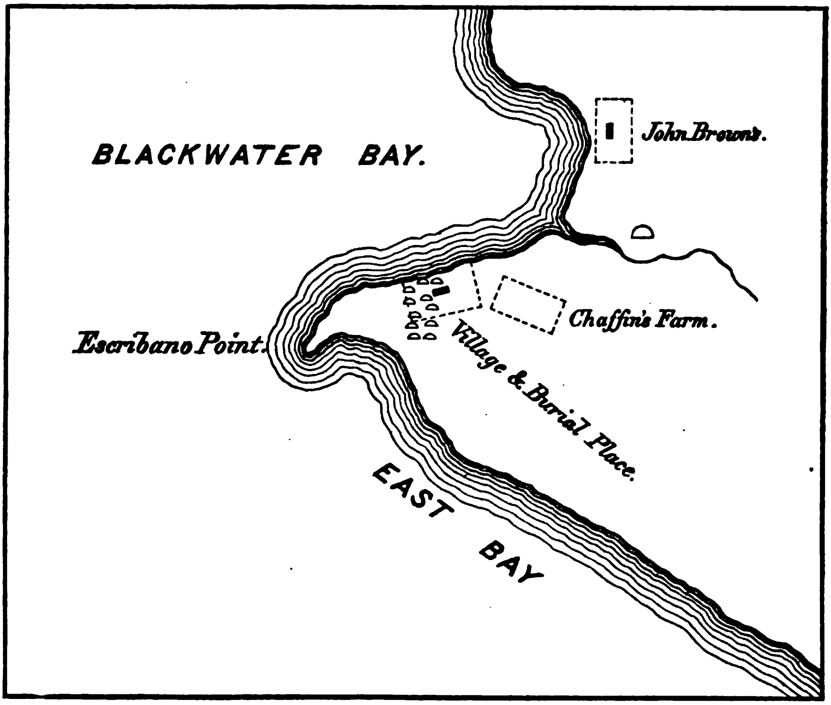
At the former site of the old village of Florida Town, in the vicinity of Ferry Pass, a large stone mortar was found weighing 157 pounds. This singular utensil is formed out of a coarse sandstone which is still quite



Map 1.—Pensacola Bay and vicinity, Florida.

abundant at Acadia, about 4 miles east of the place where the mortar was found. The marks of an iron or steel tool are plainly visible on this mortar, and seem to point to the agency of the white man in its manufacture, while its peculiar shape is characteristic of the savage artisan. Mr. Silas Jernagin, from whom this interesting relic was obtained, first saw it in the year 1828, at the house of a person who stated that it was found in a neighboring hammock many years previous to that time. As the latter person is dead, the precise facts in relation to its discovery cannot be obtained. The mortar is now in the Smithsonian Institution, and competent archæologists may be able to decide the matter. It was probably fashioned by an Indian, who had obtained an iron tool from the Spaniards, and who had gotten some idea of stone-cutting from communication with them.

At the head of Escambia Bay there are numerous small shell heaps, but no large mounds are encountered until a place is reached 1 mile north of Garcon Point, the southern extremity of the peninsula dividing Escambia and Blackwater Bays. Here are three large shell heaps situated



MAP 2.—Escribano Point, Florida.

in a small field about 200 or 300 yards from the water. They are quite regular in shape, and were probably used for domiciliary purposes. No relics were obtained here except a few fragments of broken pottery. A short distance from these mounds is a burial place, but as the evidences of its Indian origin were wanting, it was not disturbed, on the supposition that it was formerly a Spanish burial place made by early settlers.

No other Indian remains are on this peninsula excepting a small mound in Gilotown, which is of doubtful origin, as extensive digging brought to light no evidences of Indian occupation. At Escribano Point, however, on the eastern shore of the bay and about 7 miles below Milton, there is abundant evidences of a large Indian population. This point was in every way suitable for aboriginal settlement, as the numerous oyster beds in the vicinity afforded an inexhaustible supply of that favorite food, while the existence of shoal water along the shore for several miles was peculiarly favorable for shooting and spearing fish. It is quite probable that there was a large town or village at this place, and that large numbers of people resorted to it for the purpose of obtaining fish and oysters. Immense quantities of broken pottery are strewn over the ground, and all the usual evidences of Indian occupation are present; but the most important circumstance in connection with Escribano Point is the discovery of a new and singular mode of burial, which was practiced by the former inhabitants of this region. Fig. 1 gives a pretty good representation of this peculiar mode of burial in section. It seems that the body was first deposited in a grave four or five feet in depth and covered with earth. Upon this, oyster shells and pine wood were piled in large quantities; the heap was then set on fire, and the lime resulting from the burning of the oyster shells mixing

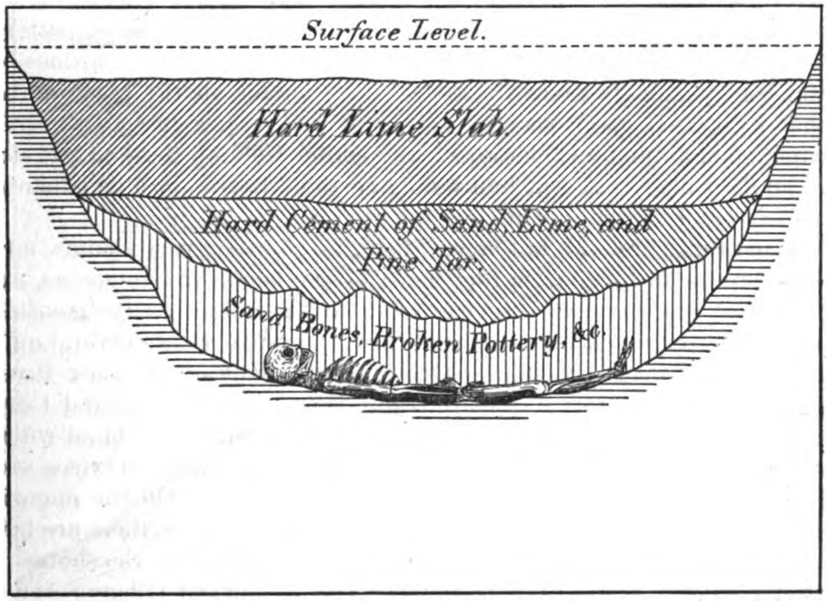

Surface Level.
Hard Lime Slab.
Hard Cement of Sand, Lime, and Pine Tar.
Sand, Bones, Broken Pottery, &c.

FIG. 1.—Mode of interment at Escribano Point, Florida.

with the sand, formed, when melted, a strong slab of cement over the grave. The rosin from the wood also assisted in the formation and the penetration of the loose sand to a depth of two or three feet below the lime formed a very effective covering for the grave.

These slabs are of all sizes, from 6 to 12 feet in diameter, and are from 2 to 4 feet in thickness. Evidences of intense and long-continued heat are plain in every case. The slabs are from 6 inches to 1 foot below the present surface of the soil, and were accidentally discovered in plowing the field. Ten or twelve were located by sounding with an iron rod, all in the area of 2 or 3 acres. Some time previous to the exploration above mentioned a complete skeleton had been washed out of the bluffs on the northern shore; but portions of the indurated sand slab are still in sight in the bank, and many fragments lay in the water at the base of the bluff. One of these pieces had some rude carvings of arrow or spear-heads cut into the surface. The fragment having these marks upon it seemed to be formed by the union of pine tar or pitch with sand, and was quite soft.

The field in which these graves are located was in cultivation at the time, and it was almost impossible to dig without disturbing the growing crop. Fortunately a grave was found at the intersection of two walks, and the penetration of the cement discovered portions of a human skeleton, very much decayed, and quantities of broken pottery. The work, however, was extremely laborious, owing to the hardness of the cement and its great thickness. The tenant on the place stated that he started a well near his door, and that on penetrating a slab he came upon a human skeleton, whereupon he filled up the well and dug in another place. About half a mile north of Escribano Point there is a small sand mound, but it contains no relics.

From this point the waters of East Bay continue very shallow for a considerable distance from the shore; oyster banks are numerous, and the beach is covered with shells and broken pottery. At the mouth of East River the shell heaps increase in size, and there are several quite large and of irregular shape. On the north bank of the East River, and about 1 mile from its mouth, there is a small earth mound 4 or 5 feet high and about 75 feet in diameter. The mound is situated within a short distance of the Mormon church, and as religious services were in progress at the time no examinations were made. On the opposite bank of the river, beginning in the field of Mr. Axelson, there are hundreds of shell heaps of various sizes, which extend along the shores for nearly a mile. No doubt this is the site of an ancient village. Immediately in the rear of Mr. Axelson's residence, on the slope of a hill, at the foot of which is an excellent spring, is a large quadrangle formed by shell banks, which evidently marks the site of an Indian village. Numerous arrow heads and other relics have been obtained here, and no doubt many more will be brought to light as the lands are cultivated.

Westward, along the shores of East River, are found great numbers of small shell heaps of all sizes in the hammock.

West of the mouth of the river, near the residence of Colonel Hooper, is the site of another village. This was situated on the banks of a small bayou, and numerous small mounds mark the position of many houses or wigwams. Excavations in these mounds revealed the situations of their fires and fragments of pottery and the usual refuse of culinary operations. Some years ago several skeletons were unearthed here by the plow. Altogether there is conclusive evidence of there having been a large population at the mouth of East River, and that there were probably two, or perhaps three, permanent villages located there.

Proceeding still westward along the peninsula between Pensacola Bay and Santa Rosa Sound, the next mounds are about 4 miles east of Redfish Point. Upon the bluffs here are two mounds, each about 12 feet high, constructed entirely of sand. Two days spent in digging revealed no objects of interest. Between these large mounds and Redfish Point many low circular mounds are scattered along the center of the peninsula. These mounds are mere elevations from 2 to 4 feet high, with bases from 50 to 200 feet in diameter, and, judging from the nature of the country, which is low and marshy, they were intended for residences.

About 1½ miles east of Redfish Point, at a place called Forty-nine Pines, are two earth mounds, one of which is 5 feet high and 80 feet in diameter; the other has every appearance of having been left in an unfinished condition. The larger mound was trenched carefully, but no objects of interest were found. There are many small shell heaps in the vicinity, and several objects were obtained from persons living near. From this place to Town Point, the western extremity of the peninsula, there are but few traces of Indian occupation.

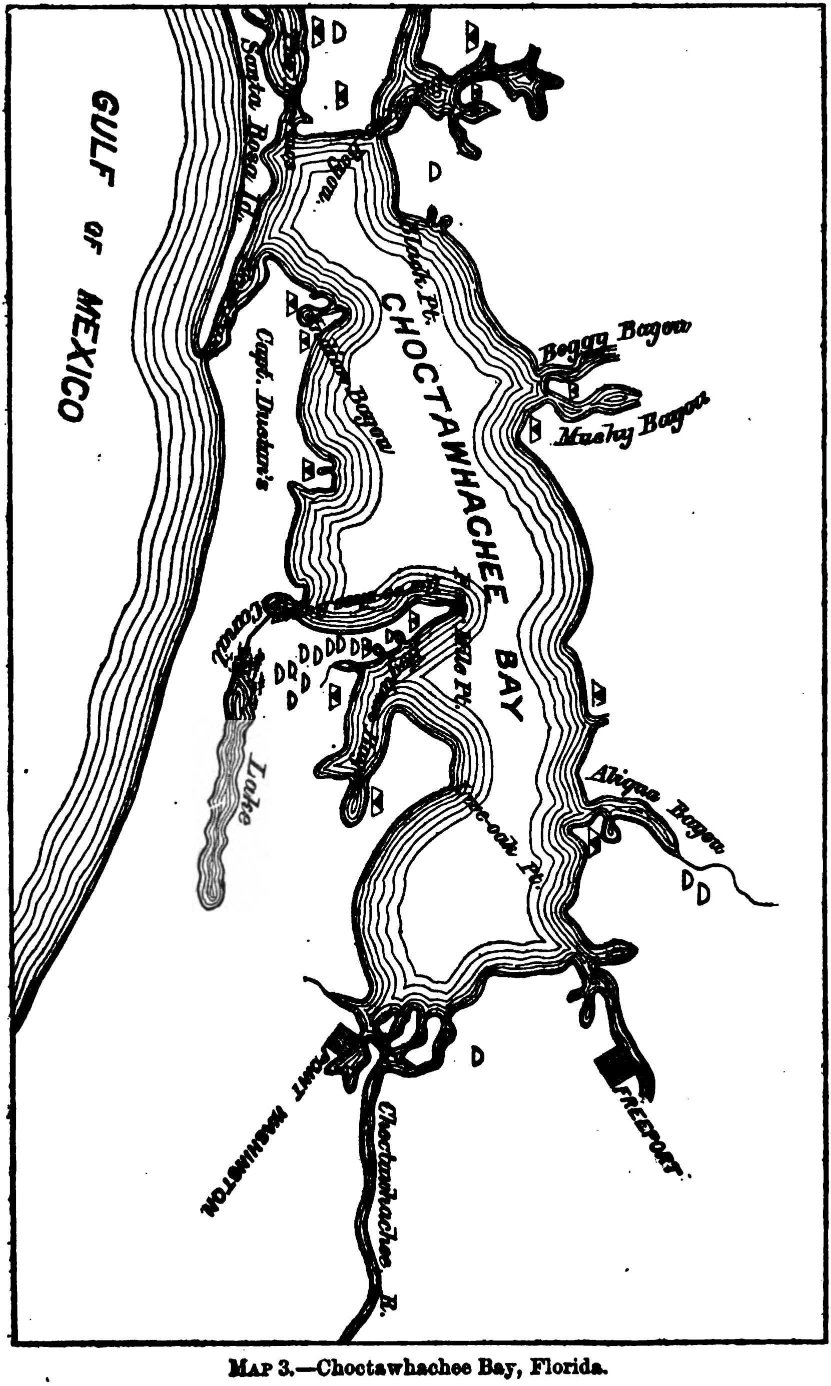
Santa Rosa Sound is a stretch of water 35 miles in length, connecting Pensacola Bay and Choctawhatchee Bay. The sound is very narrow, and does not exceed 2 miles in width at the widest part. The traces of aboriginal residence along this body of water are nearly all confined to the mainland side. If Santa Rosa Island ever contained any mounds, the shifting sands have long since covered every trace of them. In proceeding east the first shell heaps are met with at Dr. Rotherford's place, about 2 miles east of the old Government Live Oak Plantation. Immense beds of shell and the usual indications mark this as the former residence of a large population. The slopes of the hills are covered with irregular beds of shell from 2 to 6 feet in thickness, which occupy an area of several acres. The beds contain large quantities of broken pottery and numerous implements made of shell. At this place was secured the first specimen of a clay image found in this section, a fragment of a rude imitation of a bird's head.

Shell heaps occur at various points between this place and Wheeler's Spring, 6 miles west of Mary Esther post-office. At Wheeler's Spring two earth mounds of small size are found, neither of which is of special interest.

Having thus briefly described the principal remains around Pensacola Bay and vicinity, let us turn to Choctawhatchee Bay, a map of which is presented. It is almost certain that the aborigines lived around these waters in vast numbers. Every cove and headland that is habitable was occupied; all points possessing unusual advantages for hunting and fishing were densely peopled, and at several points towns of considerable size existed. There is hardly an acre of ground on the entire coast line of this bay that does not contain some evidence of aboriginal existence or occupation. These people seem also to have advanced somewhat beyond their brethren of less favored regions in the arts, for it is here that we find the first attempt to model images or figures in clay. Some of these figures are extremely rude, but others are no mean representations of the objects they are intended to imitate. The object of these images or the uses to which they were put is not evident. Most people who have expressed an opinion of them regard them as idols or objects of worship, but it would better accord with Indian customs to regard them as family totems.

The southern shores of Choctawhatchee Bay and the region about the Narrows where Santa Rosa Sound leaves that bay were peculiarly suited for the support of a large population. From these points the Gulf shores are easy of access, and the shoal waters of the bay and sound furnished inexhaustible quantities of fish and oysters. Several large fresh-water lakes inland were swarming with fish, and game is still plentiful throughout the entire region. Two points seem to have been selected by the aborigines as sites for large towns, and both were located on points or peninsulas surrounded by shoal water, a condition necessary for this peculiar mode of fishing.

The first and larger of these two towns was situated on the northern shores of Santa Rosa Sound, where it enters Choctawhatchee Bay. The sound here is only about one-fourth of a mile in width, and navigation is obstructed by numerous bars and shoals, which were once covered by oyster beds, though at present the oyster is entirely extinct in both bay and sound. On the east is Choctawhatchee Bay, and northwest lies a large branch of Garnier's Bayou. Several bold springs of excellent water break out of the bluffs, and a small fresh-water stream empties into the sound here and once passed through the center of the town. The largest mound and shell heaps are situated near this stream and in the neighborhood of the finest of the springs. The position of the largest domiciliary mound in this portion of the State is marked by a large shell heap on the bluffs above the largest spring. This shell heap, which was converted into a fort by the Southern army during the civil war, is about 12 feet high, with a base about 200 feet in diameter. About 400 yards nearly due north of this heap, situated in a dense thicket of bushes and small trees, is the mound in question. It is cov-



MAP 3.—Choctawhachee Bay, Florida.

ered with a growth similar to that around it, and so dense and tangled is the growth of vines, briers, and bushes upon it that it is difficult either to measure or explore it. Its estimated height is 25 feet, its length 250 feet, and its width 135 feet. The measurements were taken along the top, which is nearly level; of course, the base is much greater. The sides are very steep, and on the south side is a sloping roadway leading to the top.

Many excavations have been made from time to time by curiosity-seekers, and during the civil war Dr. Sandrum, of Milton, Fla., who belonged to the company which was stationed at the shell fort, made explorations through a period of eleven months. I cannot learn that anything of importance has been found excepting human bones in the shell stratum beneath the sand. Dr. S. S. Forbes, of Milton, also visited this mound in company with some gentlemen from the North, and made several large excavations in it. He reports the finding of human bones in the shell stratum, but the skulls were so decayed that preservation was not possible. Dr. Forbes also obtained several clay figures representing human and animal heads, some of which he kindly gave to the National Museum. The old cuttings made by former seekers were explored, and several new ones made, with but little reward in the way of relics excepting human bones and teeth on the shell stratum, but not in it.

The top stratum of this mound is composed of sand to a depth of 5 feet; beneath this is a layer of shell from 2 to 3 feet in thickness. On the latter, but not in it, human bones were found, thus indicating that the bodies were deposited on the shells and covered with sand. A critical examination of the shell stratum was made, and from the evidence it afforded the conclusion was reached that the mound was originally much lower, and that the shell deposit was an accumulation of kitchen refuse; that it was for a time a place of residence and used as a place of burial, and afterwards that the stratum of sand was added and the place once more fitted for residence.

The facts which favor this view are, first, that the shell stratum contains the bones of bears, deer, birds, turtles, and fishes, the usual accompaniments of Indian feasting, while the upper and lower stratums are composed of clean sand; second, that the depth of these human remains in the earth is unusual and not at all in keeping with what we already have observed in Indian burials; and lastly, the pits or excavations from which the earth used in forming the mound was taken show in a very marked manner that the material was not all removed at the same time, some being mere depressions in the soil, while others are sharply defined and comparatively recent.

The formation of this mound being by a series of additions to the original work may prove a key to the construction of many of the larger mounds heretofore described as being composed of "alternate layers of sand and shell" (see Smithsonian Report for 1879, pp. 296 and 405), and will remove the greatest difficulty in the way of our admitting them to

S. T. Walker. Florida. Plate I.

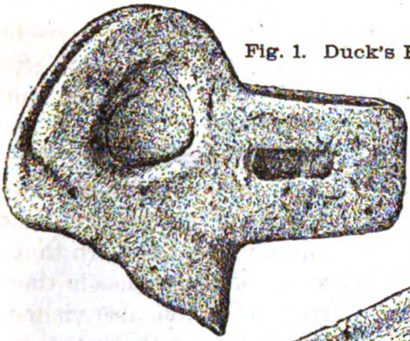


Fig. 1. Duck's Head.

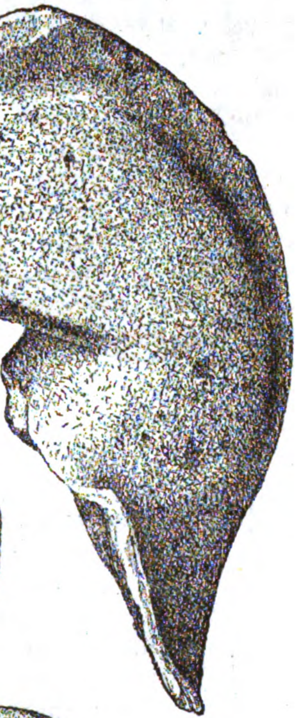


Fig. 2. Duck's Head.

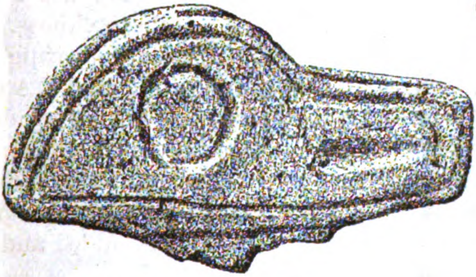


Fig. 3. Duck's Head.

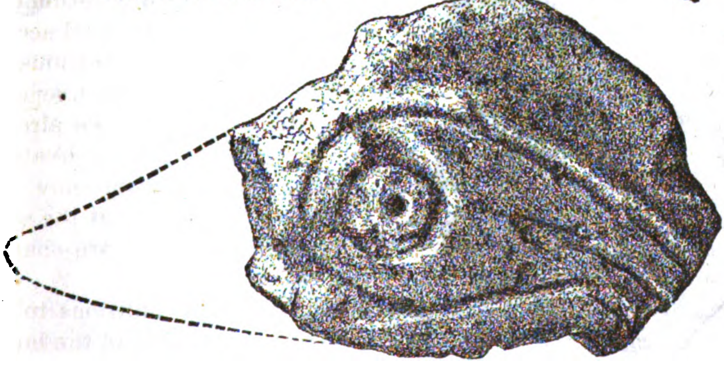


Fig. 4. Fragment of Duck's Head.

Fig. 1. Human Head.

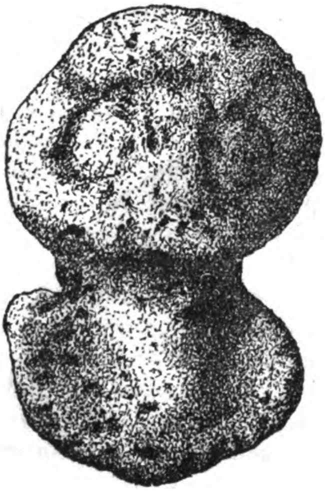
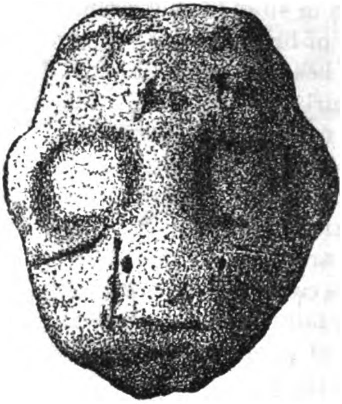


Fig. 2. Human Head.



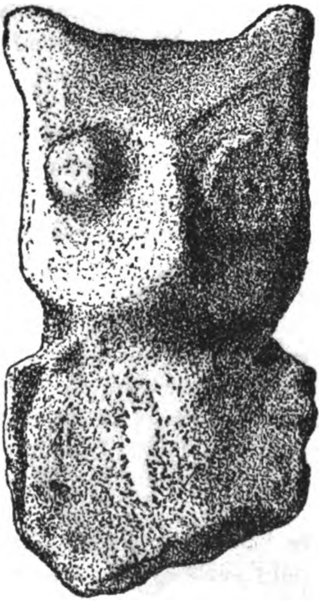


Fig. 3. Owl's Head.

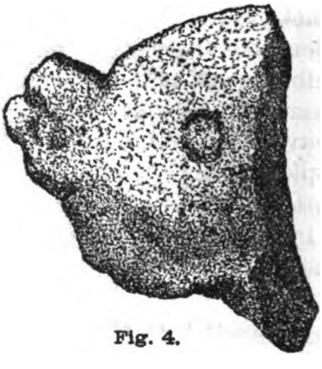


Fig. 4.

have been constructed by the modern Indians, viz, their inadaptibility to concerted and continued effort. For if the large mounds were the gradual growth of ages and varied by successive additions, by many generations, we can readily understand and accept the theory of their being the work of the modern Indian.

West of the great mound are many small circles of shells covered with soil, from 40 to 60 feet in diameter, and the earth is covered with fragments of broken pottery. Over a space reaching from the great mound to the beach, one-fourth of a mile in width, and extending along the beach for nearly a mile, are shell heaps of all shapes and sizes, from a mere bed a foot in thickness to large heaps 12 and 15 feet high. In the fields, the crops are growing in beds of shell, and the furrows are full of broken pottery and fragments of clay figures. The latter are generally representations of the heads of birds and animals, though human heads and busts are not uncommon. Many are extremely rude, rendering it difficult to catch the particular form intended to be figured, while others are pretty fair imitations of the objects copied, and are quite creditable specimens of aboriginal art. They are composed of the same material of which the pottery was made, viz, black, red, or blue clay with a mixture of some white material resembling pounded shell. Some are composed of a reddish clay and afterward covered with a finer material, nearly black, which give the object the appearance of being glazed. In other specimens the body is formed of black clay and covered with red. As before remarked, the majority of the images represent the heads of animals and birds. Of the former the wolf or fox, the squirrel, and the beaver seem to have been the favorites, while the duck or goose is often copied among the birds, though the serpent and the owl were not forgotten.

In Plates I, II, and III, may be seen rough copies of several of these images, which will give an idea of the most common forms, from the rudest up to the best hitherto obtained. These images are not found in the mounds or graves, but scattered about the fields, on the surface, or in the piles of shell, along with broken pottery. It is somewhat strange that these images are only found on the shores of Choctawhatchee Bay and Santa Rosa Sound. In all the explorations along the west coast of Florida they have not been found, nor have any been heard of in any other portion of the State. Westward, however, they exist. Dr. George Taylor, of Mobile, has several which he obtained from the shell heaps on Bon Secour Bay, near Sand Island light, and they are said to have been found in the shell heaps, along the Mississippi coast.

Many hundreds of these images have been recovered on Choctawhatchee Bay, and while a few have found their way into the National Museum, many have been destroyed or are in the hands of private parties. Others will doubtless be found as the lands are brought into cultivation.

S. T. Walker. Florida. **Plate III.**

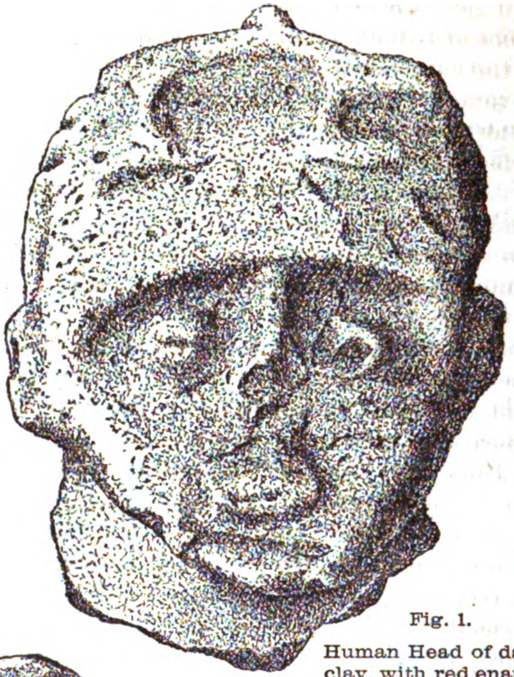


Fig. 1.

Human Head of dark clay, with red enamel.

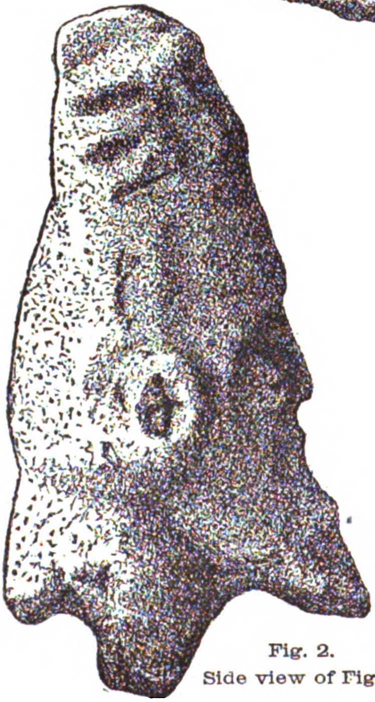


Fig. 2.

Side view of Fig. 1.

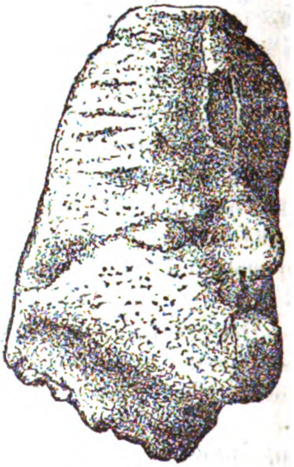


Fig. 3.

Human Head of red clay, with black enamel.

Smithsonian Report; 1883.

Passing over for the present the mounds, &c., intervening, a second great area of ancient population was about the center of the bay and on its southern side, where a point 3 miles in length extends north between Horseshoe and Hogtown Bayous, while on the south and between the point and the Gulf lies a large fresh-water lake, 7 miles in length and with an average width of a half-mile. The peculiar advantages of this point for an Indian town may be seen at a glance, viz: Fishing and hunting facilities unequaled and capable of easy defense in case of an attack. Evidences of a dense population once occupying this vantage ground begin one mile south of the extreme point and extend on both shores and down the center to the lake. These evidences consist of shell banks and heaps along the shores, and of low mounds along the center of the point. Some of the shell heaps are of immense size, while others are mere piles containing a few bushels. The mounds a short distance from the beach, and extending the whole length of the point, are slight elevations, and often five or six are placed in a straight line. Those measured were from 1 to 2 feet high and from 30 to 60 feet in diameter. The general surface of the country is low and flat, rendering it necessary to have elevations for houses.

The most important and interesting of all the aboriginal remains in this vicinity, however, is a canal leading from the head of Horseshoe Bayou into a large fresh-water lake, about 1¼ miles southeast of the bayou. This canal is about 14 feet in width at the top and 6 feet at the bottom. Its original depth was probably from 6 to 18 feet. At present it is not much over half that depth. At ordinary times the canal is dry, but during wet seasons the waters of the lake find an outlet through it to the bay. Excepting a slight angle at one place its course is straight, and the natural advantages of the ground were disregarded in order to reach the desired point by the shortest route. It enters the lake through a marsh, which at a time previous to the cutting of the canal, was probably a part of the lake, and this being drained by the canal, the ancient engineers were forced to continue their work through the marsh until deep water was reached. The lake, which is nearly 7 miles in length, contains immense numbers of fish, and the canal was cut for the purpose of reaching it in canoes, as these must otherwise have been transported overland at great expense of time and labor.

No burial places have been discovered in this region. Many clay images, however, of large size have been picked up at Mr. Henry Raddick's place on Four-Mile Point. These were all lost or destroyed by the children, as their value to science was not known.

Besides these two main centers of population, numerous smaller settlements existed at various points along the shores of Choctawhatchee Bay. Indeed, there is not a habitable spot that was not occupied, and there is not a point or cove without the characteristic shell heap. The most important of them are all correctly marked on the accompanying map, and a detailed description of each of these would involve a repetition that would be both tiresome and unnecessary. They present no peculiarities of structure or shape, and much labor expended in exploring them brought no new facts to light. The earth mounds were all probably domiciliary, and the shell heaps are the usual debris of feasts.

Nearly all the shell heaps are composed of oyster shells, which are very large, and it is a fact worthy of note that the oyster is at present extinct in Choctawhatchee Bay. Most of the heaps are covered with soil from 1 to 2 feet in thickness. From data obtained from the shell heaps of South Florida I have calculated that it requires at least fifty years to produce a stratum of soil 6 inches in thickness. From this it will appear that some of these heaps were completed from 100 to 200 years ago.

From this series of explorations the following facts seem to be pretty well established:

1. That promiscuous mound burial was practiced only to a limited extent in this locality.

2. That the races formerly inhabiting this district were further advanced in civilization than those of South Florida.

3. That it is probable all the large domiciliary mounds were built by small additions through many successive generations, and hence may have been partly the work of the modern Indians.

STONE MOUNDS OF HAMPSHIRE COUNTY, W. VA.

By L. A. Kengla, *of Washington, D. C.*

The mounds or graves described in this paper are situated on the eastern side of the South Branch Mountain, Hampshire County, West Virginia, about 1½ miles from the mouth of the South Branch River, on the property of Mr. Charles French. According to early accounts, the entire region between the Blue Ridge Mountains and the Ohio River was held by the Massawomee Indians.* The immediate locality (Fairfax Grant) was, however, the hunting ground of the Tauxenents, a band, perhaps, of the above-mentioned powerful tribe.†

The settlement of this district by the whites drove this tribe across the Alleghanies; and, after their departure, the country seems to have been a border line of warfare between the Delawares of Pennsylvania and the Catawbas of Virginia. This narrow and rough valley, from the mouth of the river to Moorefield, Hardy County, West Virginia, and probably far beyond, is replete with traditions and evidences of many a stubborn struggle—not only between contending tribes, but also between the Indians and the intrepid pioneers of West Virginia.

The locality of these mounds, known as "Shin Bottom," was also the theater of contending, bloodthirsty savages. In close proximity to the graves there is a great bowlder standing on the side of the wood, to which a very interesting tradition is attached. It is called "Indian" or "Painted Rock." On its eastern face there is a figure, supposed to represent a man in the act of throwing a tomahawk. One can easily distinguish the rude outlines of a human figure, but the hand and tomahawk have been rendered obscure by the frequent violence of curiosity seekers. The lines are clear, strong, and of a dim red color. The tradition, as given by the inhabitants, is in substance as follows:

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* History of West Virginia, page 34. De Hass.

† "Jefferson's Notes" on Virginia, page 152.

"At this point two hostile tribes, probably the Catawbas and Delawares, met and fought a terrible battle, in which all, with one exception, were killed, on the conquered side, and he succeeded in making his escape. Exasperated at this the victors, to complete their direful work, followed, brought back, and killed the unfortunate wretch, and with his own blood traced this figure on the rock."

The same account is given by Mr. Samuel Kercheval in his "History of the Valley," but with the variation that this warrior made a safe escape by jumping into the river and swimming with his head under water till he reached the Cohongornton, North Branch of the Potomac. (Page 48.)

The upper portion of this rock protects the side upon which the figure is sketched, from destruction by the elements. The South Branch of the Potomac was called Wappatomaka by the Indians. Throughout this entire range of mountains Indian mounds are numerous, and a comparatively unexplored field of archæological treasures awaits development.

The frequency of stone graves may in some degree be accounted for by the abundance of material suitable for their construction, by their proximity to fields of contest, to village sites, and to a most abundant hunting ground. They are found in much greater proportion in this than in any of the neighboring ranges. Their position cannot be restricted to any particular locality, for they are found on either side, on top, at the foot of the mountain, and in various places throughout the valley; sometimes on the river bank or on some small stream, or even in the central portions of the bottom lands. They are, however, less numerous on top of the ridges than in lower situations.

These stone graves are quite numerous in the vicinity of the "Indian Rock." In shape, both external and internal, they resemble modern graves; and since they contain an inclosure like a coffin, the term grave is very applicable to distinguish them from the earth mounds. They vary much in size, the smaller being mainly confined to the low lands while the largest are more frequently found on the tops and sides of the mountains. Those of any considerable dimensions are generally flat on top and the smaller convex. The stone of which they are made depends upon the locality; those opened were constructed of gray sandstone. The upper layers consisted of pieces as large as our street granite paving blocks, which gradually increase in size as the interior or "coffin" of the mound is reached. The "coffin" is made of large bowlders of the same stone. These stones are rarely spherical, but range from a few inches square to a weight of several hundred pounds.

No. 1. The first grave examined was situated midway on the side of the mountain. It was built in a small hollow or ravine, down which in wet seasons water flowed. Within 40 or 50 yards there were three others, two of which were opened and examined.

It (1) was very large, about 50 feet in length, 25 in width, and from 4 to 5 in height. It was flat on top and extended lengthwise north and south. The excavation was commenced on top at the southern extremity. After working downwards and northwards through the mass of rock for the distance of 3 feet, we came to some very large bowlders. Taking these as a guide we continued to work along the western side towards the north end of the mound. All the rock that remained at the north end and over the body of the "coffin" or cavity was next removed, and the earthy débris cleaned away. From the south end of the "coffin" was then removed the large rocks with which it was filled.

Then began the examination of the dark earth with which the floor was covered. The mass of the material was decayed wood-earth together with a small quantity of light colored clay. At the lower end were found one long bone and more fragments, presumably leg or thigh bones, and at the north end a fragment of a skull. No pottery or stone implement of any description was exhumed. The sides of the casement for the remains were constructed of large bowlders 1½ foot high, placed closely together throughout the entire circuit. Beneath there was a floor of flat stones, and at the upper end one was raised about 2 inches above the rest, near which the fragments of skull were found.

No. 1 B. As yet only half of the first mound had been torn away, and encouraged by the find, though we mainly directed our attention to the discovery of stone implements, the destruction of the remaining mass was begun.

Commencing on the east side of the grave just opened we soon reached another wall of large bowlders, running in a direction parallel to and placed directly alongside of the wall of the former. Upon removing the stones from the sides and central portions as before, the excavation of the coffin was commenced. But a most careful search was ineffective in bringing to light any relics. The absence of all human remains may be possibly attributed to the position of the mound, which was such that a very large quantity of water annually passed through it, rendering the decomposition of the bones more rapid.

No. 2. About 20 yards to the right, when looking down the mountain and facing the east, a second grave was opened, which was situated a little to the side of the hollow.

This mound, though not so large, extended in length in the same direction, north and south, as the former. In appearance, (save that it was not flat,) both externally and internally, it was similar to that of the one previously explored. It contained a single inclosure or coffin. No remains except a fragment of a long bone were found.

No. 3. A third of this group, situated about 30 yards down the mountain and on the lower side of an old road, was examined. Its construction and general outlines were the same as those already described. No remains were discovered, and from its position in the deepest part of the hollow it is supposed that all traces had long since been destroyed.

No. 4. The fourth mound was situated about 200 yards from the "Indian Rock," near the base of the mountain. Though much smaller, it resembled the above in all particulars. A large number of fragments of bones belonging to various parts of the body were collected. The exterior shape of the mound had been very much disfigured by hunters.

Mr. French, the owner of the property, needing stone for building purposes, had previously opened several graves and removed from them a quantity of bones and some pieces of pottery.

There were no means by which we could judge the age of these mounds, even approximately. The first graves or stone heaps examined were encircled by a grove of oak and locust trees of an inferior size. Near the fourth there grew several large oaks, but all were at too great a distance to be of any avail in such a determination. The amount of earthy matter on or within could not be relied upon as affording any definite clew, since very little could penetrate the grave, and what was there could easily have been deposited in the lapse of time by nature. The stones were not placed immediately upon the corpse, perhaps; but they rested upon logs and brush, which were supported by the walls of the inclosure. If this supposition be correct, the amount of debris could have been greatly increased.

It is generally supposed that these mounds were quite small at first, and were increased in size by new interments and by the addition of stone from time to time. It is said that whenever a friendly Indian or tribe passed a grave, each individual, out of respect, added a stone or more to the heap. Though this may be plausible, it is just as likely that it was the final interment of the body, and that the size of the mound depended upon the rank and tribal standing of the person. If, on the other hand, these interments were only temporary, it is probable that the large mounds were the final resting places of a large number of bodies by secondary interment.

This hypothesis is in accordance with the customs of many tribes, east and west, and was practiced by the natives of the lower districts of Virginia long after its settlement by the whites.*

The total absence of all stone implements is accounted for by the residents, the supposition being that these were women's graves or of those members of the tribes who were of minor importance. The find of pottery in one or two would strengthen this supposition.

This theory is again to some extent sustained by the opening of several mounds on the top of this mountain yielding bones, pyrites (cubo-octohedral, crystal), arrow-heads, and fragments of pottery. In contradiction, however, to the above, one grave, opened by Mr. Joseph Pancake on his farm in the river bottom, about 2 miles above Romney, in this county, contained a celt, a pipe, and some arrow-heads.

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* "Jefferson's Notes" on Virginia.

On the front of this pipe, at the upper rim of the bowl, there was carved an eagle in a neat and tasteful manner. Some years ago the party from whom were procured the above specimens opened a large mound in Mineral County, West Virginia, near the town of Ridgeville. In external appearances, according to report, it was similar to those described, but, instead of in a coffin-shaped repository, the body was buried in a sitting posture. The skeleton was nearly whole at the time of exhumation; the feet rested upon the floor; the legs against a wall, above which in the seat were the thigh bones; and against a second wall leaned the bones of the back and chest. The arms seemed to have been placed in a careless position at the side, with the hands open and lying upon the shelf with the thigh bones. The head rested in a recumbent position on a third shelf. A fragment of pyrites was found near by, which is supposed to have been placed in one hand. Among the bones and débris there was discovered a brass button of continental style.

For the authenticity of his description the narrator referred to several gentlemen residing near the locality, who were present and assisted in the work, and in whose possession the bones were when last heard of.

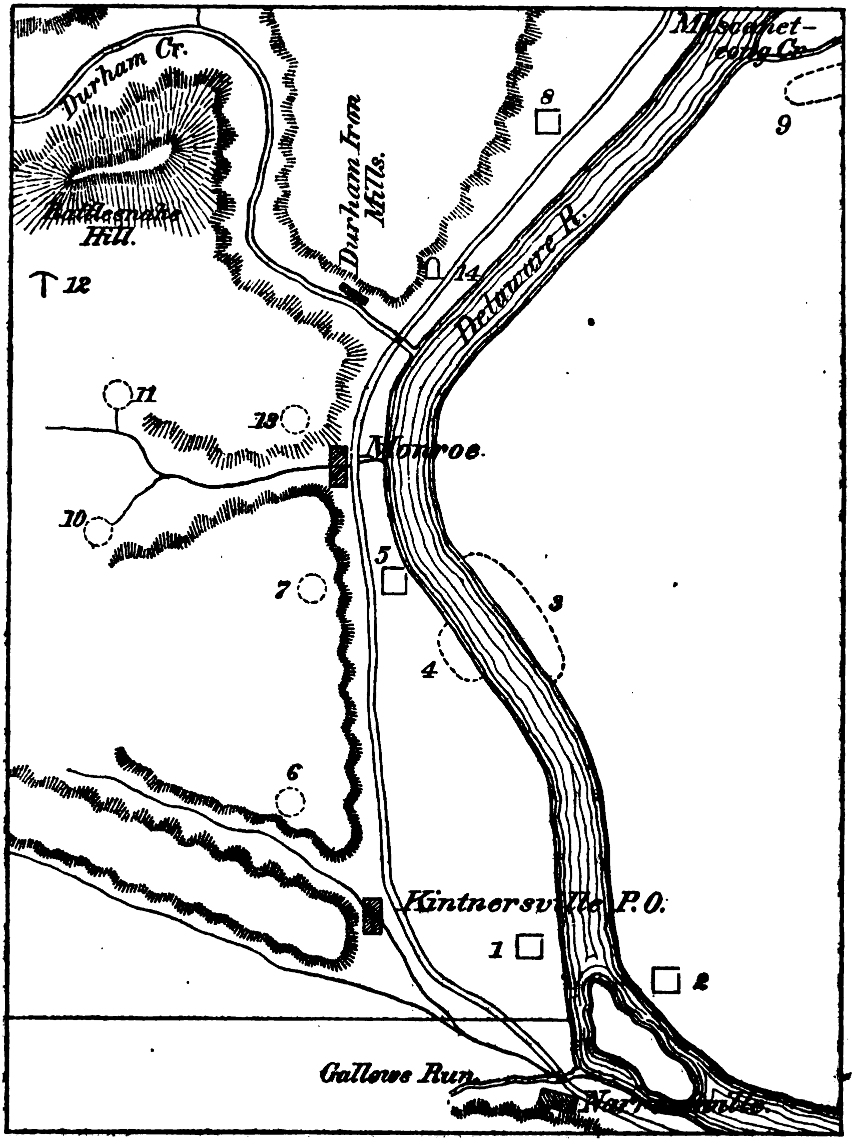
Other mounds and remains were found in abundance as the country was cleared and the land cultivated. The specimens of pyrites and pottery found on the South Branch Mountain have been added to the collection of archæological remains from the district, deposited at Georgetown University.

REMAINS IN BUCKS COUNTY, PENNSYLVANIA.

By John A. Ruth, *Riegelsville, Pa.*

Durham, the most northeastern township of Bucks County, Pennsylvania, is situated on the banks of the Delaware River, 9 miles south of Easton, and by railroad 76 miles north of Philadelphia. The township covers an area of about 9 square miles, and the greater part of it is drained by the Durham Creek and its tributaries. The surface is hilly, the soil fertile and in a high state of cultivation. To its original occupants it presented many natural advantages, and the remains of their workmanship found buried in the soil show that they saw these advantages and made use of them. The southeastern part of the township was their favorite resort. This part of the Delaware Valley is about 1½ miles long, and about one-half mile in width at the widest part. It is bounded on the east by the Delaware River, and on the west and south by a range of bluffs extending from the village of Monroe to the

Narrows, which rise perpendicularly to the height of nearly 400 feet. It is strongly defended by nature, and the scenery is not surpassed by any in the county. There are other localities in the township where relics are found, but nowhere in such abundance as in the locality just mentioned. I shall now describe these and other remains in the order in which they are numbered on the map.



Remains in Durham Township, Bucks County, Pennsylvania.

No. 1 is the site of what once was an extensive village, situated on the banks of the Delaware, near the mouth of Gallows Run, and about one-quarter mile from Kintnerville. It extends along the Delaware several hundred yards, and back from the river about 50 yards. Its extent may easily be traced by the broken cobblestones and chips of flint and jasper which are thickly strewn over the surface. Many of the cobblestones bear marks of fire. Among this refuse a large number of relics have been found. They exhibit all degrees of workmanship from the rudest to the most skillfully wrought. The most abundant relic is the arrow-point, of which have been here collected more than 400 specimens. Many show by their workmanship that they were made by a people who had advanced in the stone art to a high degree of skill. In this locality have also been found many hammers, spear-heads, scrapers, and plummets. The spear-heads found are generally broken. Among the rarer implements are drills, polishing-stones, axes, celts, knives, paint-cups, pestles, ceremonial hatchets, and amulets. The hatchets and amulets are all broken, but are highly polished and well proportioned. They show great skill and patience on the part of those who shaped them. Fragments of pottery are plentiful. Some of it is ornamented. Many of the fragments are well preserved, but others are crumbling and have the appearance of great age. The material used in the manufacture of the stone implements of this and the other village sites in the township is that found in the locality. Probably one-half of the arrow-points are made of trap, the remainder of jasper, quartz, red shale, &c. But few specimens are made of the last-named mineral, which is not a very durable material for stone implements.

No. 2 is also the site of an ancient village, on the farm of Mr. Clark, one mile north of Holland Station, Hunterdon County, New Jersey. The extent of this village was not as great as that at No. 1, but it has added to our collection many fine specimens. Among these is half of the bowl of a stone pipe, the only fragment of a stone pipe yet found. Its shape is similar to Fig. 179 in Dr. Abbott's Stone Age in New Jersey. Two stone axes of very rude workmanship were picked up at this place. The rudest is an ordinary cobblestone notched at the sides, near one end, and slightly grooved half way across one side. The other is an oval cobblestone, 11 inches in length, with a narrow groove around one end. No attempt seems to have been made to sharpen either of these axes.

No. 3 is a locality on the farm of Mr. Snyder, near Holland Church, where have been found a number of spear and arrow points, most of them broken. Tradition tells us that this was an ancient battle-ground. Two tribes lived in the vicinity, and the children, in their wanderings, met each other and quarreled about a large grasshopper which one of them had found. This resulted in a war, and this locality is said to be the place where the decisive battle was fought. The conflict was witnessed by a white man from the opposite side of the river. Such is the tradition as it exists in the neighborhood.

No. 4 is on the farm of Mr. Overpeck, near Monroe. This locality is peculiar in its relics, which consist of triangular arrow-points and fragments of finely ornamented pottery. Besides these, no other relics were discovered, except several pieces of clay pipe-stems, an amulet, several celts, and fragments of pestles. Since the writer has collected at this place, he has found but one arrow-point with a stem, while of triangular arrow-points more than 100 specimens have been gathered, most of them broken. A large number of fragments of pottery were found scattered over the surface. They were in a good state of preservation, and many of them are finely ornamented, especially those pieces which formed the rim of the vessels, some of which are perforated. Chips of jasper occur in the soil, but very few broken cobble-stones. It is difficult to explain why all the arrow-points are triangles, and why the pottery is of better workmanship than that of any other locality in the township.

No. 5 is the site of a small village on the farm of Mr. Tranger, of Monroe. It is situated about 100 yards north of No. 4, but is quite different from it in the character of its relics. Here chips of flint and broken cobble-stones are found again. The relics are principally spear and arrow points, knives, scrapers, plummets, &c.

No. 6 is a locality on the farm of Mr. Overpeck, where we find spear and arrow points, some rude pottery, hammers, and occasionally a few other implements.

No. 7 is on the edge of the bluff, on the farm of Mr. Aaron Tranger. In the character of its relics it is similar to No. 6. Some of the arrow points are made of a material not found in the locality. This place was probably occupied by parties guarding the villages in the valley against invasion. The position commands a good view of the Delaware Valley toward the north.

No. 8 is a locality on the farm of Cooper and Hewitt, one-half mile south of Riegelsville, where have been found arrow-points and a few other relics. The refuse scattered over the surface indicates that it was the site of a small village.

No. 9 is on the farm of Mr. Riegel, near the mouth of the Musconetcong Creek, Hunterdon County, New Jersey. Spear and arrow points are found here.

No. 10 is on the farm of George Shick, between two springs, where have been found spear and arrow points, hammers, knives, scrapers, plummets, a fine drill, &c.

No. 11 is also around a spring, on the farm of Jacob Richards. The relics are the same kind as those found at No. 10.

No. 12 is an ancient jasper mine on the farm of Cooper and Hewitt. The excavation made in mining the jasper is still to be seen. Around it is a ridge of earth and stones, thrown out by the miners. The ground is overgrown with brush and small oak, and is not cultivated for a short distance around the mine. The excavation is partly filled with stone hauled from the adjoining fields. Very few arrow points are found around the mine. Chips of red and yellow jasper are found in large quantities, scattered over more than 20 acres around the mine. With them are found numerous river pebbles and cobblestones with hammer marks on them. Some are worn off around the entire edge; others were originally nearly round, and through use became still more so. Nearly all the hammers found on village sites have finger pits, but these have none, and are found only around this mine. These facts seem to indicate that they were used as hammers for blocking out the jasper into pieces of a suitable size for implements, and that these blocks were then carried to the villages, where they were finished.

No. 13 is on the farm of Henry Adams, situated on the top of the hill. It commands a fine view of the Delaware and Muscanetcong Valleys. Here have been found but two kinds of relics—a few arrow-points and several dozen plummets. Most of the plummets found on village sites are similar to Figs. 204 and 205 in Dr. Abbott's Stone Age in New Jersey, but those found in this locality are nearly all like Fig. 203.

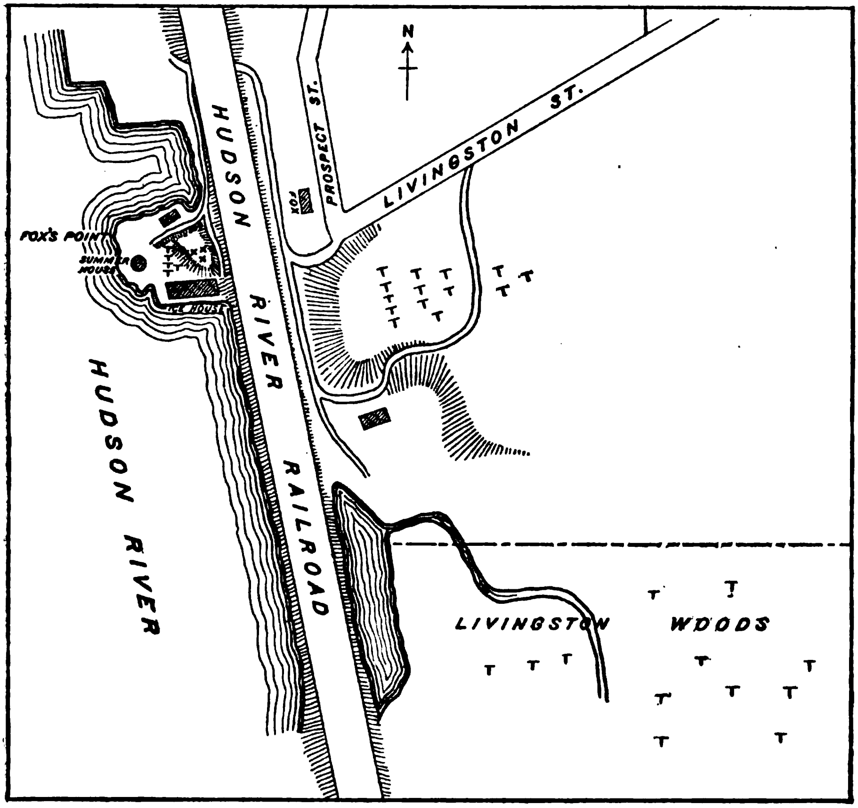
No. 14. Durham Cave is the name given to a cavern in the limestone formation on the north side of the Durham Creek, near its mouth. The cave extends into the hill toward the west, parallel with the creek. A large part of it has been destroyed by quarrying the limestone, which is of excellent quality and was used in the furnace near by. The main passage was about 150 feet long, from 4 to 40 feet wide, and averaged about 12 feet in height. The floor descends as you enter, and at the farther end is a fine spring. A few stalactites formerly hung from the roof. About forty years ago, when the cave was opened, petrified bones were found in one of the rooms. They were removed by several scientists who had come from New York for that purpose, and were sent to some scientific association in that city. A number of interesting relics were also found, among them spear and arrow points, beads, and a skull. The latter is said to have been sent to some museum in Philadelphia. A small room on the right of the main passage was, years ago, named Queen Esther's Drawing-room, after an Indian woman.

RELICS IN POUGHKEEPSIE, NEW YORK.

By Henry Booth, *of Poughkeepsie, N. Y.*

In the southern part of Poughkeepsie, Dutchess County, New York, and extending beyond the city limits, there used to be a large deposit of molding sand. This has been dug out during the last seven or eight years and carted away. The accompanying map shows a part of this sand bed, which has proved to be of great interest. In October, 1882, some fragments of human skeletons were turned up by the laborers on

Fox's Point. This was reported to the writer by Mr. E. W. Frazer, the foreman, who very kindly afforded every assistance in his power to make an examination of this part of the sand bed. The deposit of sand is overlaid by earth, which is generally about 1 foot deep. The stratum of sand varies from a few inches to 4 or 5 feet in depth. On top of this sand, directly below the soil, the larger part of the stone implements were found. At the place on Fox's Point, marked on the map with three Greek crosses, the skeletons were dug up. The ground here is a few feet above the level of the Hudson River Railroad. Enough skulls and fragments of skulls were dug up to permit the supposition that six bodies had been buried here. These bones were found at depths varying from 1 foot to 3 feet below the surface. Of four bodies there remained nothing but parts of the skulls, a few teeth, and fragments of ribs. Of another body there were leg bones, fragments of ribs, finger bones, vertebræ, and a nearly complete skull, including the lower jaw. This skeleton lay on its right side, with the knees drawn up to the chin. Of another body there were a few vertebræ and finger bones, and a nearly complete skull, including the lower jaw. This skull rested on



Graves and relic sites in Poughkeepsie, New York.

its chin, facing westward, or toward Hudson River. Underneath it was found a piece of burnt sandstone, rudely chipped into the form of an arrow-head. With the exception of this stone and a bit of chipped hornstone, nothing was discovered with the bodies. In the hollow on Fox's Point, below and west of this little hillock, the sand, when dug up, showed traces of fire, being red instead of yellow. Intermixed with it were a great number of broken stones, which also seemed to have been burned. Here were found many implements, both fragmentary and entire. They were pounders (oval or round cobble-stones with worked depressions on either side for the fingers), spear-heads, arrow-heads, pestles, &c. On top of the rising ground east of Fox's Point and the railroad many stone implements were found. In 1876 Mr. E. W. Frazer picked up near this place half of a steatite dish, which is now in the American Museum of Natural History in New York City. No iron implements of any kind have been recovered here, and no bodies except those mentioned above. The total number of perfect implements from this locality, now in the writer's possession, is as follows: Pounding-stones, 32; pestles, 5; arrow and spear points, 103; hoes, 6; axes, or hammers, 2; drill, 1; rubbing-stone, 1. The fragments and flakes amount to several hundreds.

NOTES ON THE WAMPANOAG INDIANS.

By HENRY E. CHASE, A. B., *of Brookline, Mass.*

Every year the signs of Indian settlements along our coast are becoming fewer. The experience of the last two years has taught the writer that great ignorance prevails among those persons whom we might most reasonably expect to direct us to the sites of Indian towns. He has thought it worth while, therefore, to put on record, for the convenience of others, the exact sites of all the Indian shell heaps and other indications of Indian settlement seen during the summers of 1882 and 1883. Besides the mere description of the towns in their present condition, and the implements, weapons, &c., found at or near them, a general history will be given of what has been recorded or is known on the subject from other sources, together with a detailed account of the origin, language, customs, manners, traditions, and religion of these Indians, so far as it was possible to gather them. Further study shows that much of this information is already in such available form in the works of Gookin, Williams, and a few other early writers, who had the best opportunities to study the Indians, that all subsequent scholars will prefer to consult them in the original. References will be made to these and other works which are useful in the study of the Indians referred to in these notes, and only so much of them will be quoted as is absolutely necessary to give one unacquainted with the Indian tribes of

New England a fair knowledge of the Wampanoag tribe, to which the Indians of Cape Cod, Martha's Vineyard, and Nantucket belonged. The practice of the writer has been, after finding alone the site of some Indian town, and obtaining all the information available from the farmers and others living in the vicinity, to turn to the volumes of the Massachusetts Historical Society's works and Barber's Historical Collections, "a general collection of interesting facts, traditions, biographical sketches, anecdotes, &c., relating to the history and antiquities of every town in Massachusetts," and learn what is there said of the Indians once living there. This information was sometimes very satisfactory, but until recently went ahead of the explorations, and there are still a few important additions to be made to the map of Indian settlements on Cape Cod. In the rambles in search of arrow-heads, stone hatchets, &c., little of the history of their former owners could be learned from persons now living near by, the usual information being to the effect that "when the oldest inhabitant was a boy," an old Indian or squaw lived near the spot where the arrows or shell heaps exist. In a few other places, as at Mashpee and Gay Head, the mixed descendants of the Indians may still be seen; but, with the exception of a few names, like Pocknet and Attaquin, their names are English, and their hair inclined to curl, owing to their frequent intermarriage with the negroes. A friend who has given the matter some attention writes that there are now probably none of unmixed blood among the Indians of Mashpee, though many of the people have a strongly marked Indian appearance. Neither these Indians nor some of the same sort at Gay Head could give any exact information in regard to the sites of old Indian towns, and the conclusion is inevitable that they know less about such things than some small white boys living near by, who are in the habit of collecting arrow-heads. At several places on Cape Cod, Martha's Vineyard, and Nantucket people are becoming interested in Indian relics, and it is frequently impossible to buy a stone hatchet (which the owner may have thought worthless), because he heard that another man had sold such a grooved stone for a great price. Several boys have collections of arrow-heads amounting to two or three hundred; and middle-aged men have said that in certain places they could once find all the arrow-heads they wished, and have been surprised when there were found only one or two, perhaps not one. Old men say that it was the habit of the farmers to plow up most regularly all those fields which had been already cleared by the natives, for these always gave the best crops, owing to the rich black soil that was usually found there. On the east side of Bass River, and on Indian Neck, near Wellfleet Harbor, may be seen the wisdom of this practice; for at these places the most thrifty vegetables in the fields were those growing in the dark earth and scattered shell-heaps. But by this practice the most lasting monuments of the Indians have been erased, their graves levelled, their shell heaps scattered, and their weapons and implements of stone plowed under or picked up and removed. On Nantucket and Martha's Vineyard it was easier to get information on our subject, probably partly from the fact that Indian names have been more easily preserved on islands, where may still be found many descendants of the first white settlers, and partly, in the case of Nantucket, through the publication by the Old Colony Line of a historical map of that island, surveyed and drawn a few years ago by the Rev. E. C. Ewer, D. D. To give the reader a general idea of the tribes inhabiting New England, and the relative strength and country possessed by the tribe to which the Cape Cod, Martha's Vineyard, and Nantucket Indians belonged, a few quotations will be made from the writings of Mr. Daniel Gookin, one of the magistrates of Massachusetts colony, and for many years, commencing with 1656, "betrusted and employed for the civil government and conduct of the Indians in Massachusetts colony by order of the general court there."

"OF THE PRINCIPAL INDIANS THAT INHABIT NEW ENGLAND.

"1. The principal nations of the Indians that did or do inhabit within the confines of New England, are five: 1, Pequots; 2, Narragansitts; 3, Pawkunnawkuts; 4, Massachusetts, and 5, Pawtucketts.

"2. The Pequots or Pequods were a people seated in the most southerly bounds of New England, whose country the English of Connecticut jurisdiction doth now, for the most part, possess. This nation were a very warlike and potent people about forty years since; at which time they were in their meridian. Their chief sachem held dominion over divers petty sagamores, as over part of Long Island, over the Mohegans, and over the sagamores of Quinapeake, yea, over all the people that dwelt upon Connecticut River, and over some of the most southerly inhabitants of the Nipmuck country, about Quinabaag. The principal sachem lived at or about Pequot, now called New London. These Pequots, as old Indians relate, could in former times raise four thousand men fit for war, and held hostility with their neighbors that lived bordering upon them to the east and north, called the Narragansitts, or Nechegansitts; but now they are few, not above three hundred men, being made subject unto the English, who conquered and destroyed most of them upon their insolent deportment and just provocation, anno 1638, of which we shall have occasion to speak more particularly in the sequel of our history.

"3. The Narragansitts were a great people heretofore, and the territory of their sachem extended about thirty or forty miles from Sekunk River and Narragansitt Bay, including Rhode Island and other islands in that bay, being their east and north bounds or border, and so running westerly and southerly unto a place called Wekapage, four or five miles to the eastward of Pawcutuk River, which was reckoned for their south and west border, and the easternmost limits of the Pequots. This sachem held dominion over divers petty governors, as part of Long

Island, Block Island, Cawesitt, Niantick, and others, and had tribute from some of the Nipmuck Indians that lived remote from the sea. The chief seat of this sachem was about Narragansitt Bay and Cannonicut Island. The Narragansitts were reckoned in former times able to arm for war more than five thousand men, as ancient Indians say. All do agree they were a great people, and oftentimes waged war with the Pawkunnakutts and Massachusetts, as well as with the Pequots. The jurisdiction of Rhode Island and Providence Plantations and part of Connecticut people, possess their country. These Indians are now but few, comparatively; all that people cannot make above one thousand able men.

"4. The Pawkunnawkutts were a great people heretofore. They lived to the east and northeast of the Narragansitts; and their chief sachem held dominion over divers other petty sagamores; as the sagamores upon the island of Nantucket and Nope, or Martha's Vineyard, several others, and some of the Nipmucks. The country, for the most part, falls within the jurisdiction of New Plymouth Colony. This people were a potent nation in former times; and could raise, as the most credible and ancient Indians affirm, about three thousand men. They held war with the Narragansitts, and often joined with the Massachusetts, as friends and confederates against the Narragansitts. This nation, a very great number of them, were swept away by an epidemical and unwonted sickness, *An.* 1612 and 1613, about seven or eight years before the English first arrived in those parts to settle the colony of New Plymouth. Thereby Divine Providence made way for the quiet and peaceful settlement of the English in those nations. What this disease was, that so generally and mortally swept away, not only these but other Indians, their neighbors, I cannot well learn. Doubtless it was some pestilential disease. I have discoursed with some old Indians that were then youths, who say that the bodies all over were exceedingly yellow, describing it by a yellow garment they showed me, both before they died and afterwards.

"5. The Massachusetts, being the next great people northward, inhabited principally about that place in Massachusetts Bay where the body of the English now dwell. These were a numerous and great people. Their chief sachem held dominion over many other petty governors, as those of the Weechagaskas, Neponsitt, Punkapaog, Nonantum, Nashaway, some of the Nipmuck people, as far as Pokomtakuke, as the old men of the Massachusetts affirmed. This people could, in former times, arm for war about three thousand men, as the old Indians declare. They were in hostility very often with the Pawkunnawkutts, who lived on the south border, and with the Pawtucketts, who inhabited on their north and northeast limits. In *An.* 1612 and 1613, these people were also sorely smitten by the hand of God with the same disease, before mentioned in the last section, which destroyed the most of them, and made room for the English people of Massachusetts colony, which people this country, and the rest called Pawtuckett. There are not of this people left at this day above three hundred men, besides women and children.

"6. Pawtuckett is the fifth and last great sachemship of Indians. Their country lieth north and northeast from the Massachusetts, whose dominion reacheth so far as the English jurisdiction, or colony of the Massachusetts, doth now extend, and had under them several other smaller sagamores, as the Pennakooks, Agawomes, Naamkeeks, Pascatawayes, Accomintas, and others. They were also a considerable people heretofore, about three thousand men, and held amity with the people of Massachusetts. But these also were almost totally destroyed by the great sickness before mentioned, so that at this day they are not above two hundred and fifty men, besides women and children. This country is now inhabited by the English under the government of Massachusetts."

Pawkunnawkutt was the Indian name for the country around the present city of Bristol, R. I. King Philip, Pometacom, or Metacomet, lived here, and it was from this place the nation of which he was sachem derived its name. These Indians were, however, sometimes called the Wampanoags, or Wamponoags. Another writer says: "The east side of Narragansett Bay was inhabited by the Wampanoags (who are next in power to the Narragansetts), on the broad regions of country extending to Massachusetts Bay, Cape Cod, and Nantucket. The most powerful sachem of the Wampanoags, at the time of the arrival of the Plymouth settlers, was Massasoit, also called Osemequin. His two sons and successors were Wamsutta, called by the English name of Alexander, and Metacomet, known as King Philip." The five tribes of Indians mentioned used the same language, with, however, some slight difference in the expression, not unlike the differences found in several counties in England. They could readily understand each other, but could not understand some of the inland Indians, particularly the Mawhawks, or Maquas. "Their government is generally monarchical, their chief sachem or sagamore's will being their law; but yet the sachem had some chief men that he consults with as his special counselors. Among some of the Indians their government is mixed, partly monarchical and partly aristocratical, their sagamore doing not any weighty matter without the consent of his great men, or petty sagamores. Their sachems have not their men in such subjection but that very frequently their men will leave them, upon distaste or harsh dealing, and go and live under other sachems that can protect them; so that their principal endeavor is to carry it obligingly and lovingly unto their people, lest they should desert them, and thereby their strength, power, and tribute would be diminished." This description of their government, given in Mr. Gookin's history of the Indians in New England, shows the peculiar, uncertain hold which their rulers had upon them, and throws a good deal of light on the relation which soon came to exist between the rulers of the Wampanoags, Wamsutta and Phillip, and their praying Indians upon Cape Cod, Martha's Vineyard, and Nantucket. Very early Massasoit saw that the English were acquiring a dangerous ascendancy over the minds of his Indians, and begged the English to stop trying to change the religion of his Wampanoags, for they were apt to become poor subjects to him. It is a suggestive fact that in two noted cases in which King Philip sought to administer justice in accordance with Indian law, that of John Gibbs, at Nantucket, for speaking evil of Philip's father, Massasoit, and that of John Sassamon, at Assawamsett Pond, for revealing Phillip's plans to the English, the offenders were preachers of the Gospel to the praying Indians. The English tried to alienate still further the praying Indians from their allegiance to Philip by adding to their list of jurors at the trial of Sessamon's executioners "six of the indifferentest, granest, and sage Indians," that, by their concurrence with the white jurors, the Indians of the praying towns might be committed to the cause of the whites. To make the conviction of the culprits sure, however, they had the full number of twelve white men before adding the six Indians to the jury. The execution of these three Indians by the English was the immediate cause of the Indian war, threatened for some time, but purposely delayed by Philip until he could get the aid of the Narragansetts. The names of Elliot and Williams will ever be associated with the conversion of the Indians under their charge near the Massachusetts and Providence Plantations; but to the less celebrated efforts of the Mayhews, on Martha's Vineyard and Nantucket, and of Mr. Treat, Mr. Bourne, and Mr. Cotton, on Cape Cod, are chiefly due the conversion of the Indians in those places, and the friendly attitude taken by these Indians during the war that devastated the region lying just west of them. The following quotation in reference to the labors of the Mayhews states very well the effect of their labors, and sets forth the tractable nature of the Indians of Martha's Vineyard, which, it may be added,' were shared by those on Nantucket and Cape Cod:

"At the time of the settlement (Martha's Vineyard, in 1642) the Indians were very numerous in this town (Edgartown), perhaps more so than in other parts of the island. The Indians of Martha's Vineyard were hospitable, and more tractable than those on the main. Governor Mayhew and his son, as soon as they became settled, attempted to civilize them and introduce the Gospel among them, and their success surprised and delighted the pious of that age. The younger Mayhew labored in this benevolent work with diligence and fervor till his death, in 1657, when it was assumed by his father, and in a few years by his son, and it was carried on by some member of the family till the beginning of the present century. Nearly all the Indians on the island became professed Christians. At first they were called 'catechumens,' but were formed into a church in 1659, and from this another church arose in 1670. The English found most essential advantages from the ascendancy which was gained over their minds; they were disarmed of their rage; they were made friends and fellow-subjects. In King Philip's war all the Indian nations on the main were confederated against the English. Alarm and terror were diffused on every side; but Governor Mayhew was so well satisfied with the fidelity of these Indians that he employed them as a guard, furnished them with the necessary ammunition, and gave them instructions how to conduct themselves for the common safety in this time of imminent danger. So faithful were they that they not only rejected the strong and repeated solicitations of the natives on the main to engage in hostilities, but when any landed from it, in obedience to their orders which had been given them, they carried them, though sometimes their near relations, to the governor, to attend his pleasure. The English, convinced by these proofs of the sincerity of their friendship, took no care of their own defense, but left it entirely to the Indians, and the storm of war which raged on the continent was not suffered to approach, but these islands enjoyed the calm of peace. This was the genuine and happy effects of Mr. Mayhew's wisdom and of the introduction of the Christian religion among the Indians."

The Indians of Cape Cod had been very generally christianized before King Philip's war broke out, and most of them remained faithful to their white neighbors, and aided in protecting the cape against hostile invasion. It is very probable that some of them left the praying towns to join Phillip, as did many from the praying towns near Boston. In the records of drafts of men levied in Massachusetts and Plymouth colonies to fight Philip are found the names of southern or friendly Indians. About twenty of these Indians, under the leadership of an Indian of the Wampanoag tribe, named Captain Amos, living at or near Cape Cod, took part in the disastrous fight near Rehoboth. Rev. Noah Newman, in writing of this encounter, states that Capt. Michael Peirse, with fifty-one of his soldiers and eleven of these friendly Indians, were killed. Because of the friendly attitude of the Cape Cod, Martha's Vineyard, and Nantucket Indians toward the whites, the Indian history of these places is not so eventful as that of the rest of the Wampanoag country lying between Buzzard's Bay and Narragansett Bay. The farmers in the latter region have pointed out to me the past summer the swamp, at the foot of Mount Hope, where Philip was shot, and the place where Benjamin Church encountered Tuspaquin and his warriors on Assawamsett Neck, in Lakeville, Mass., and many other places made memorable during this bloody Indian war. On Cape Cod and adjacent islands there were no hostilities during King Phillip's war, and all encounters between these Indians and the whites took place at a very early date, when white explorers thought it expedient to plunder and kidnap the natives, and they in turn thought best to kill the crew of any shipwrecked vessel, and so secure the plunder. On Nantucket, Gookin writes that some bad Indians committed this offense even later than the year 1649, and were punished for it. In the year 1619, Capt. Thomas Dermer landed at Martha's Vineyard and was attacked by the natives. He and his companions gallantly defended themselves with their swords and escaped. Several Indians were killed in the fray. When Bartholomew Gosnold visited that island, in 1602, it is written that he trafficked amicably with the natives of the vicinity, and it is very probable that Captain Dermer, or Martin Pring, who had spent the summer at Edgartown a few years before (in 1603), did something to provoke the Indians, or Captain Dermer would have been differently treated. Captain Weymouth had kidnapped five Indians in Maine, and one of Captain Smith's commanders, named Hunt, carried off forcibly twenty-seven natives from Massachusetts Bay—Squanto, afterwards the interpreter of the settlers at Plymouth, being one of the number. Such treatment of the Indians would not be likely to win their confidence, and it is no wonder that when the Pilgrims landed the natives should try to take revenge upon them, especially after they had been robbed of corn, themselves pursued, and the graves of their people disturbed by this very company of men. Three days before the landing of the Pilgrims at Patuxet, or Plymouth, while exploring in what afterward became the town of Eastham, they were attacked at night or early in the morning by the Nauset Indians, probably led by Aspinet, a subchief, who owed allegiance to Massasoit. This spot, called Namskeket by the Indians, was named by the English "The First Encounter." Some years before this, the explorer Champlain had an encounter with the Indians of Cape Cod, or Cap Blanc, and immediately started back to Europe. At a time of great want in Plymouth colony, through the assistance of Squanto and Massasoit, the colonists obtained supplies of corn from the Indians of Barnstable County. Very soon the land itself, which was so easily cultivated, attracted emigration from Plymouth, and from this time forward there was little to be recorded but the deeding of land to whites, the poverty, drunkenness, and plagues of the natives, and the labors of good men like Mr. Treat to instruct them and improve their condition. We have few particulars in regard to Indian wars of the Wampanoags, either among themselves or with other tribes, those given by Gookin and in the history of Nantucket being almost the only ones. On Nantucket, according to their traditions, there were two tribes of Indians, one that crossed from the Vineyard and landed on the west end of the island, the other that came across from Monomoy, or Chatham, and landed upon the east end. These two tribes, or portions of the Wampanoag tribe, engaged in a war about the year 1630, the last Indian war on the island, and the only one of which we have any knowledge. In studying the history of Indian tribes in almost any part of the country one cannot fail to be struck by the terrible ravages that disease makes when once it enters their midst. Longfellow, in his tale of Hiawatha, did not overlook this sad feature in Indian life, and the description of the pestilence is hardly too strong to represent the mortality and distress produced among the Indians by many diseases not usually fatal to whites. On the sixteenth page of Barber's Historical Collections is given a very interesting account, first published in "Good News from New England," of a visit made by Edward Winslow to Massasoit, whom the Plymouth colonists had heard was lying very ill at Mattapuyst. The sachem's condition is graphically described, and the primitive means employed by the Indians to cure him. One passage of the description is as follows: "When we came thither (Puckanokick) we found the house so full of men, as we could scarcely get in, though they used their best diligence to make way for us. There were they in the midst of their charms for him making such a hellish noise as it distempered us that were well, and therefore unlike to ease him that was sick, etc." The simple but sensible methods used by Mr. Winslow for his recovery, and their success, show what might often have been accomplished for others in a similar condition. According to early writers, the most general and fatal diseases among these Indians before the whites came were yellow fever, and a hectic fever ending in quick consumption. The traditional method for "laying" the yellow fever upon Martha's Vineyard would be most likely to spread the disease. Smallpox and even measles were very fatal in the Indian towns after the coming of the whites, if not before. Intemperance soon increased the natural improvidence of the Indians, undermined their constitutions, and provoked quarrels among them which often ended in a fatal drunken fray. The following description of a portion of the Wampanoag tribe living at Middleborough, preserved in one of the earlier volumes of the Massachusetts Historical Society's collections, gives a fair description of their methods of living, and of the prevalence of hectic complaints among all this tribe of Indians:

"Before the town (Middleborough) was incorporated this place went by the name of Namaskett, which was an ancient Indian name, and was formerly plentifully inhabited by the Indian natives, who were governed by the noted sachem Tispacan. But when the town was incorporated and began to be settled by the English, the natives began to scatter and decrease; but there is now a settlement of them which descended from the ancients of Namaskett, which inhabit a part of said town known by the name of Betty's Neck (which place took its name from an ancient Indian woman by the name of Betty Sesemore, who owned that neck), where there are now eight Indian houses and eight families. (About the year 1794.) The general number of Indians, old and young, that live there is between thirty and forty. Their houses are poor; they own some land; they live imprudent; are very fond of liquor. They till their land, which produces good crops of corn and rye, which they trade off for spirituous liquors with any retailer that is so destitute of principles as to trade with them, so that by the middle of the winter their corn and grain is generally gone. Then, by their baskets and brooms (which they make) they purchase it to supply immediate necessity. They are very subject to hectic complaints, for more than half that are born are carried off young with consumptions."

Within the past summer I found living on Betty's Neck only three Indians, all women, descendants of Massasoit, and relatives of Philip's faithful follower, Tuspaquin, the Black Sachem, chief of all the Nemaskett and Assawamsett Indians. Full particulars of this interesting family, whose home is in North Abington, Mass., may be learned in a book published by the mother, Mrs. Zerviah Gould Mitchell, now aged 76 years. She claims to be a lineal descendant, in the seventh generation, from the "great and good Massasoit." Both she and her daughters have received good education, and the mother became eloquent in describing the treatment of Tuspaquin, Annawon, and some other Indians engaged in King Philip's war. The mother and the daughter Melinda, or Teweeleema, have aquiline noses and long black hair, and are as good types of this tribe of Indians as I have ever seen. It is only while their house in North Abington is let that they expect to remain on this spot, for which they appear to have a strong attachment. We were informed by the mother that the "men folks" of their family were dead or gone, and it is very probable that after this generation passes away no more Indians will ever live on Betty's Neck, unless this family is quickly re-enforced by Indians of Mashpee or Gay-Head. The native population on Cape Cod at the time the whites landed cannot be exactly known, but, through the labors of those men interested in the conversion of the Indians upon Cape Cod, not many years after its settlement, we know that there was once a large native population which dwindled rapidly away, and of which time has now left us hardly a trace. A letter dated Sandwich, July 1, 1674, from Richard Bourne to Daniel Gookin, on the "Progress of the Gospel among the Indians in the colony of New Plymouth," gives a list of the praying Indians in the towns of Cape Cod at that date. He states explicitly that he has been "conversant with and employed amongst them these many years," and it is very probable that the list includes all the places of any consequence at the time of his writing, for special mention is made of all places which still need religious aid. In the year 1792, when the first volume of the Massachusetts Historical Society was published, containing this letter from Mr. Bourne, the sites of some of the Indian towns mentioned by him were already forgotten, and so explanatory notes, written largely by the Hon. Nat. Freeman, of Sandwich, were inserted, now seen inclosed in brackets. The proportion of these converted Indians to the unconverted ones may have have been small at this early date, but in regard to the former Mr. Bourne appears to have gained exact information, even mentioning the number of those converted who could read and write. The number that could read and write will be omitted in the quotation, as it is for the names and sites of towns that the letter is valuable to us rather than their degree of culture.

"First there is at Meeshawn, or near the head of the cape [Cape Cod. Part of these Indians probably lived in Provincetown, but the greatest number in Truro] and at Punonakanit, or Billingsgate [New Wellfleet], that are praying Indians, that do frequently meet together upon the Lord's Day to worship God; and likewise the rest as followeth, 72. "Potonumaqunt [the southeast part of Eastham], or Nawsett [the north part of Eastham], or Eastham, there are praying Indians 44. Manomoyik [Chatham] there are praying Indians 71. Sawkattukett [the west part of Harwich], Nobsquassit [the northeast part of Yarmouth], Matakees [the land between Barnstable and Yarmouth Harbors, lying principally in the northwest part of Yarmouth and] Weequakut [pronounced at present Cheekwacket, the southwest part of the east precinct in Barnstable], praying Indians 122. Satuit, Pawpoesit, Coatuit [Coatuit is in the southwest part of Barnstable], Mashpee, Wakoquet [Satuit, or Sanctuit, Hawpoesit, and Wakoquet or Waquoit, are all within or near the limits of Mashpee] there is praying Indians 95. Codtannut [probably Canaumut Neck in Mashpee], Ashimut [or Shimuit. On the west line of Mashpee], Weesquobs [between Pokesset meeting-house and Wenaumut Neck in Sandwich], there is praying Indians 22. Pispogutt [concerning this see Mr. Freeman's letter], Wawayoutat [Waywayantic or Wewewantett, Wareham], Sokones [commonly pronounced Succonussett. Part of Falmouth], there is praying Indians 36. Cotuhtikut [or Titticut, part of Middleborough], Assoowamsoo [or Assoowamsett, part of Middleborough], there are praying Indians, one with another, 35." Besides these places, Mr. Bourne mentions Mannamit [in Sandwich, near the bottom of Buzzard's Bay], also Mananiet, which is supposed to be the same place.

"As for lands set out to the Indians, distinct from the English lands, there are divers places already bounded, viz: Where I am most conversant there is a tract of land preserved for them and theirs forever, under hand and seal, the which is near ten miles in length and five miles in breadth. There is the like done at Comassakumkanit [probably Herring Pond, in Plymouth], near Sandwich, and at Cotuhtikut."

Mr. John Cotton, pastor of the English church at Plymouth in 1674, writes to Mr. Gookin that he sometimes preached to a company of 40 praying Indians at a place called Kitteaumut [or Katamet, now spelled Cataumut; part of Sandwich, on Buzzard's Bay]. Mr. Cotton spells Mashpee, Marshpang. The following letter of the Hon. Nat. Freeman, dated September 23, 1792, published in the same volume of the Massachusetts Historical Society's Collections, in reference to the sites of Indian towns on the cape, gives a fuller account of some of the places and Indians mentioned in the letter of Mr. Bourne: "From the best of my own recollection, and the little additional information I have obtained, I believe there are not more than two or three Indians, and those females, remaining in Sandwich. In Barnstable I know of not one, except it be in a part of Mashpee included in Barnstable limits for taxing. These, as they are not within the boundaries of the township, are included in the number for Mashpee. In Falmouth proper there may be, at a place called Cataumet [the same which is noted in Holland's map], seven or eight, some of whom are mixed. An Indian territory, called Herring Pond, in the neighborhood of Sandwich, about 5 miles northwest from this village, and so extending thence along shore to Monument Ponds, all included within the township of Plymouth, I am told by Joseph Nye, esq., one of their guardians, contains about a hundred and twenty souls, one-half of whom are mixed. The Indian name of this territory I never could learn. They appear to have been considered as a distinct tribe, now known by the name of the Herring Pond Indians. Might not this place be Comassakumkanit?" (See Gookin's *Hist. Collection*, p. 108.)

The same Mr. Nye, who is guardian also to the Mashpee tribe, says that there are about two hundred and eighty souls in that place, of whom at least two-thirds are mixed. I suppose the Indians have diminished since 1785, but the mixed race may be increased, as many negroes and mulattoes from abroad have, since that period, settled there. I know of none below Barnstable upon the Cape, except at Potanumaquut, a part of Harwich, and there, I believe, there may be six or seven souls only. The Rev. Mr. Damon thinks there is one in Truro. Wakoquet, Weequakut, or Coquit (see Gookin's *Hist. Collect.*, pp. 197–200), probably may be Wawquoit. The latter seems as like the sound as either, but as the first is associated with Satuit, Pawpossit, Coatuit, and Mashpee, it is most likely to be that. Then the second may be what is now called Chequocket, or by some Shequocket, which is in the southwest part of the east parish in Barnstable, where there is an inlet called Lewis's Harbor, not the same as Lewis's Bay, which is more easterly. Or if it comport better with the history, it may be a place and pond near Howland's Ferry, Tiverton, R. I., called Quaket, or Quaket Pond. There is a place in Mashpee called Popponessit. This may be Pawpoesit. Weesquobs cannot be located. Great neck in Mashpee is a place famous for eels. The Indians, when they go in a canoe, with a torch, to catch eels in the night, call it Weequash, or, anglicized, weequashing. There was a great number of Indians formerly on this neck, and it seems now the metropolis of Mashpee. Whether any supposed affinity between Weesquobs and Weequash will justify a conjecture is hard to say. Codtaumut may be Canaumut Neck, in Mashpee. Kitteaumut is probably Cataumut in Holland's chart. Shumuit, which I suppose to be Ashimuit, is about equidistant from Cataumut, on Buzzard's Bay, and Canaumut Neck; rather nearest the latter. It might be associated with either in Gookin's Historical Collections. But if we suppose Weesquobs to be Whakapee, a pond in Mashpee, then, most likely, Codtaumut and Canaumut must be the same. If we associate Cataumut, Shumuit, and Great Neck (for Weesquobs) together, there would then be other places not contiguous. Wawayontat is said to be Wareham. There are two rivers which pass through Wareham into the bay. That through the town is called Agawam, and the Indians generally call Wareham by that name. The other, which is near the west end of the township, toward Rochester, is called Weantick. This may be Wawayontat. Falmouth still goes by the name of Sokonesset, and is undoubtedly the Sokones mentioned by Gookin. There is a place on Buzzard's Bay, on Sandwich side, called Pokesset; but I have been told Indians used to call it Poughkeeste. It is the second parish in Sandwich, about 8 miles southwest from my house [near the meeting-house of the first parish], but not more than two leagues across the bay to the mouth of Weantick River, and lies on a line between Wareham and Falmouth, adjoining northerly on Cataumut, which is rather in the edge of Falmouth than Sandwich, as you supposed. Can Pokesset be the same as Pispogutt? There is a neck of land within Pokesset, called Pachawesit. This seems as dissimilar as the other. The place where Doctor Bourne's house stands, viz, about two miles up Manumit River, and near the Herring Pond, is called Pumpisset; and a neck of land in Wareham, next to Monument, or Manumit, and parted from it by a small gut, is called Cowesit. The syllable *pis* is in one of them; but Pokesset was the most noted Indian place. Besides these places, the writer has heard of the following places, which are spelled phonetically: Scusset, the next village westerly from this; Unset, or Onset, and Quansit, two little bays, or shores at the bottom of Buzzard's Bay, within Wareham; Cohasset, the gut between Manumit and Cowesit; Wenaumut, a neck within Pokesset; Mashne, an island in Buzzard's Bay; Quisset, an inlet in Falmouth, north shore Buzzard's Bay; Nobska, near Wood's Holl, a bluff shore or head; Naashawn, Nashawinna, Cuttahunka, Pesk, Elizabeth's Islands; Menemsha, a bight on the Vineyard shore; Quashne, or Quashnet, a river in Mashpee; Shanton, or Scorton, the lower end of Sandwich; Muset, a creek in Sandwich off Spring Hill; Skunkamug, south side of the parish of Great Marshes; Hockanum, between Yarmouth and Nobscusset; the east parish of Yarmouth; Suet, or Sesuet, a neck in Yarmouth; Naamskeket, the south side of Harwich; Skeket, or Skaket, the lower part of Harwich next to Eastham. The following summary of the Indian population at different times on Cape Cod is found as a foot note to a part of Gookin's Historical Collections, page 201, printed in 1792: "Christianity met with much better success in Plymouth than in Massachusetts. In the year 1685, the praying Indians in this colony amounted to fourteen hundred and thirty-nine, besides boys and girls under twelve years of age, who were supposed to be more than three times that number." (Hutch., vol. i, p. 349.)

In the year 1693 there were within the limits of Eastham (which then included Wellfleet and Orleans) 505 adult Indians, to whom Mr. Treat preached; 214 adults, besides stragglers, at Mashpee and places adjacent, under the care of Mr. Rowland Cotton, minister of Sandwich; 180 Indians, to whom Mr. Thomas Tupper preached; and 500 more, under the care of Mr. John Cotton, minister of Plymouth. (Matthew Mayhew's Narrative, pp. 46–53. See also Mather's *Magnalia*, book vi, p. 60, and Neal's *Hist.*, chap. vi, p. 256.) In the year 1764 there still remained in the colony 905 Indians of every age, 223 of whom were in the county of Plymouth, 515 in the county of Barnstable, and 167 in the county of Bristol. Since that period their numbers are much lessened. There is at present [1792] no Indian church in the counties of Plymouth or Bristol, and Mashpee only, in the county of Barnstable. Of 134 Indians in Dartmouth and Freetown in 1764 there are now [1792] about 33 left. (Information of Rev. Mr. Backus.)

In the other towns of Bristol they are probably extinct. There are four or five families of Indians in Middleborough, two or three in Pembroke, five or six persons in Bridgewater, and probably a few scattered about in other parts of the county of Plymouth. (Inf. of Rev. Mr. B.) In the county of Barnstable a few Indians remain at Potanumaquut, a few in the town of Barnstable, and a few at Herring Pond, between Sandwich and Plymouth. But the great body of them reside at Mashpee, where there are about 80 families, consisting principally of a mixed race, not more than 40 or 50 persons being pure Indians. (MS. Let. of Rev. Mr. Mellen.)

In September 14, 1674, Mr. Cotton writes as follows of the Indian towns upon Martha's Vineyard: "When I lived at the Vineyard the praying towns were Chappaquidgick [an island east of Martha's Vineyard, separated from it by a strait about a quarter of a mile wide. It is within the limits of Edgartown], Nashamoiess [the south part of Edgartown], Sengekontakit [also spelled Sanchecantacket, the north part of Edgartown], Toikiming [Taacame or Takame, Tisbury], Nashuakemmink [Nashonohkamack, Chilmark], Talhamo [probably part of Chilmark], one church there gathered long before, but no officers. Since I lived here [Sandwich] I went over with Mr. Eliot thither [in the year 1670], and Hiacoomes was ordained pastor; John Tokinosh, teacher; John Nonoso and Joshua Mummeecheeg, ruling elders."

In the year 1692 the number of Indians on Martha's Vineyard was much lessened. The church, however, at that time consisted of more than 100 persons. (Mat. Mayhew's *Nar.*, p. 28.)

In the year 1720 there were on the Vineyard six small villages, containing about 155 families and about 800 souls. Each of these villages was supplied with an Indian preacher. There was also a small assembly at Winthrop's Island; another, consisting of twelve or fourteen families, at Tucker's Island and Nashaun, which lie near together. There were a few Indians left at No Man's Land. Beside these Indian assemblies there was a small congregation of Baptists at Gay Head. [Exp. Mayhew's *Nar. of Ind. on Mar. Vin.*, p. 2.] For the state of the Indian Baptists on Martha's Vineyard in the year 1774, see Backus's *Hist.*, vol I, p. 439. In the year 1764 there were remaining in Duke's County 313 Indians, 86 of whom were in Edgartown, 39 in Tisbury, and 188 in Chilmark. About that period they began to intermarry with negroes, in consequence of which the mixed race has increased in numbers and improved in temperance and industry. At present [about 1792] there are of pure Indians and of the mixed race about 440 persons, 75 of whom live on Chappaquiddick [not more than one-third pure]; about 25 at Sanchecantacket [not more than one-fifth pure]; about 40 at Christiantown, in the north part of Tisbury, toward the Sound [about one-half pure]; about 24 at Nashonohkamuck [about three-quarters pure]; and about 276 at Gay Head [of which about one-quarter are pure]. In this account unmixed negroes are not reckoned. [Information of Captain Jerningham and Benjamin Bassett, esq.]

Barber states in his Historical Collections that at the time of the settlement by the English of Nantucket, in 1660, there were nearly 3,000 Indians on the Island. Upon what authority he makes this statement I cannot discover; but another authority, probably much better than that on which he made the statement, places the number of Indians on the island, in the year 1659, at about 700. In the year 1694 the Indians on Nantucket were about 500 adults. There were five assemblies of praying Indians, and three churches; two Congregational, and one of Baptist. [Gardner's Let. in Mather's *Magn.*, book vi, p. 56.]

Three hundred and fifty-eight Indians were remaining the 16th of the eighth month, 1763, when a fever began among them, and lasted till the 16th of the second month, 1764. Of this distemper 222 died. [See Hutch. *Hist.*, vol. I, p. 35.] The Indians on the island are now [1792] reduced to 4 males and 16 females. [MS. of Friend Zaccheus Macy.]

On Cape Cod, at present [1883], there is not a pure-blooded Indian, so far as I can learn. The notes accompanying the Rev. E. C. Ewer's Historical Map of Nantucket state that the last Indian on that island died in 1822, and the last man with Indian blood in him, Abram Quary, died in 1855. While near Shimmo, on Nantucket, last summer, this man, Abram Quary, was described to me by a white man who once knew him and evidently regarded him as a curiosity. While walking with my brother through the graveyard at Vineyard Haven, on Martha's Vineyard, in the summer of 1882, studying the inscriptions on the stones, we came suddenly on an old grave-digger, busily at work preparing a grave. We asked him a few questions about the most common Vineyard names, and also about the Indians on the island. He told us, beside a few other interesting facts, that he knew that the last pure-blooded Indian, a woman, had been buried on the island only a very few years before. In about 260 years, then, from the landing of the Pilgrims at Plymouth, a race of men, then occupying eastern Massachusetts, has practically become extinct.

> Alas, for them, their day is o'er,
> Their fires are not from shore to shore;
> No more for them the wild deer bounds,
> The plough is on their hunting-grounds;
> The pale man's axe rings through their woods,
> The pale man's sail skims o'er their floods,
> Their pleasant springs are dry.
>
> (*Charles Sprague's Centennial Ode*, 1830.)

Unlike the aids to the study of Egyptology, the monuments of the Indians are of the simplest kind, very apt to be wholly overlooked by the modern observer, or regarded by him as an interesting curiosity for his children to play with. In truth, this tribe of Indians appear to be almost wholly lacking in the spirit which prompted the Egyptians to raise lasting memorials of their lives and deeds. These Indians were poor, and not very far advanced in the arts, and could not, therefore, be expected to erect such monuments; but nevertheless, one would hardly expect, after having carefully passed over so large a region as that of Cape Cod, Martha's Vineyard, and Nantucket, where we know that many Indians once lived, and where abundant evidence may still be seen of their skill and perseverance in fashioning articles of ornament, weapons, or utensils, to find not a trace of any attempt on the part of the natives, before their contact with the whites, to convey to later generations an idea, either historical or otherwise, in a form likely to last. It is possible that records of wars or other remarkable events in the history of this tribe may have been kept by them, as in the case of other tribes, preserved as pictographs embroidered on wampum; but these, of course, cannot now be found if they ever were in the possession of this part of the Wampanoag tribe. Inscribed tablets of stone, or bowlders with picture writings upon them, have, I believe, never been found in this region, if we except, of course, such instances as the gravestones at Gay Head, inscribed after the Indian language, had been reduced to writing by the whites. In an Indian burying-ground on Assawamset-neck, in Lakeville, near Middleboro', on the land of Mr. Charles Jewett, containing twenty-five or more graves, was one bearing a peculiar inscription of two letters or characters.

This graveyard is the resting place of the relatives, and some of the ancestors of the three Indians before mentioned residing on Betty's-Neck, descendants of Massasoit and Tuspaquin. The latter name, contracted into Squinn or Squeen, appears on one of the stones, lately broken into fragments by some vandal Two or three of the graves have well engraved slate head-stones, much like those in any old grave-yard of New England. Most of them have no stones whatever, and a few have a short, thick, plain slab of stone or bowlder at one or both ends. It is very probable that all these graves were made after the Indians had ceased to bury interesting relics with their dead. I mention this fact because I heard that the three surviving Indian women living near by were greatly distressed a short time ago to find that some relic hunters had tried to dig up some of their ancestors. Considering the circumstances of these burials, and the prominent part taken by the ancestors of these persons in the early Indian history of this vicinity, it seems a pity that the graves cannot remain undisturbed as a reminder to future generations of the Indians of New England, now that so few monuments of them remain. Not to overlook entirely a very interesting rock about which there has been endless speculation, it may be well to mention here the "Dighton Rock," or "Writing Rock," which was found by the first white colonists beside the Taunton River, on the Berkley side, opposite the landing-place for sloops at Dighton. This spot does not lie within the country of the Cape Cod Indians, but it is a part of the territory of the Wampanoag tribe, to which they belong.

Prof. F. W. Putnam, of Harvard College, assures me that it is now the belief of the best scholars that the inscription on this rock is nothing but an Indian pictograph, and that the attempt, by the aid of subjective drawings of it, to make it serve as testimony of a visit to this country by the Northmen, or Phœnicians, is pure folly in the light of later discoveries of pictographs, closely resembling it, in other parts of the United States. A picture of this rock, with a very good description of it, copied from the second volume of Kendall's Travels, may be found on pages 117, 118, and 119 of Barber's Historical Collections. Mr. Kendall traveled through the northern parts of the United States in 1807 and 1808. He made a careful examination of the Dighton Rock, visiting it several times for the purpose. Mr. Kendall writes of another inscribed rock as follows: "The only sculptures on any rock not on the Writing Rock consist in two or three figures or characters having some similitude to the letters XOO, and which are seen on the corner of a slab of stone lying within a few yards of the Writing Rock." Mr. Kendall presents a series of wild conjectures and Indian traditions in regard to the origin of the Writing Rock, prevalent among the learned and unlearned of his time, to which list may be added that of Mr. R. B. Anderson in his work entitled "America not discovered by Columbus." The latter writer attempts to prove the truth of the old Scandinavian or Icelandic tales relating to the discovery of America by the Norsemen, 500 years before Columbus set sail, by appealing to the circumstantial evidence of the skeleton in armor discovered at Fall River, the tower at Newport, and the Dighton Writing Rock. In the interpretation of the writing on the Dighton Rock, Mr. Anderson discovers some marks which he considers are Roman characters, copied by him as follows: CXXXI. This, he says, represents 151, for the Icelanders reckon 12 decades to the 100. Then he finds a small row-boat between the letters N and M. He makes N stand for Norse, the boat for seafaring, and the M for men, and proceeding in this way confirms, to his own satisfaction, the truth of the old legends. He closes his fourteenth chapter as follows: "Upon the whole, the Dighton Writing Rock removes all doubt concerning the presence of Thorfinn Karlsefne and the Norsemen at Taunton River, in the beginning of the eleventh century." The "skeleton in armor" discovered at Fall River will be described at length in speaking of certain relics once found upon Cape Cod which appear to throw some light upon the probable history of these far-famed remains. So far as I have been able to discover in my researches upon Cape Cod, Martha's Vineyard, and Nantucket, for evidence of a former Indian population there, all the testimony or evidence to be found is of an unintentional sort on the part of the natives. The Indians appear to have expended unstinted labor, with considerable skill, in fashioning their implements, weapons, and ornaments of stone, but none whatever in preserving their history. Therefore the methods employed in tracing out the settlements of Indians in these places must be, or were for me, like those of a person discovering the camps of a very early prehistoric race. It is really surprising how little beside the remains usually found at prehistoric settlements can now be found on the sites of several of the largest Indian towns on Cape Cod, such as those at Wellfleet, probably the seat of Mr. Treat's labors among the praying Indians.

After a careful examination of the site of one of these settlements near Drummer Pond, in South Wellfleet, which was evidently once of considerable importance, I was able to find only a few bricks, which had formed fire-places; a few bits of iron nearly rusted away; fragments of coal, and glass bottles, and a goodly number of broken clay pipes and pipe-stems of the ordinary Irishman's style. Besides these, and to my eyes much more conspicuous, were the common indications of an Indian town, the shell heaps, bones of animals and fishes, with numberless chippings of quartz, porphyry, jasper, &c., made by the Indians in fashioning their arrow-heads. Perfect arrow-heads were not common, but the desert expanse of coarse sand and gravel surrounding the town was one of the best of places to find arrow-heads unless they had already been picked up. Along the coast, shell heaps are the most striking evidence that we have of prehistoric tribes. Shell heaps are found in almost all parts of the world upon the sea-coast, and their size and contents indicate a more or less prolonged halt or settlement there of a family or tribe. Some only mark stopping places on a journey; others were the sites of villages long inhabited by the natives, but most of them, in the opinion of Professor Putnam, were places to which the Indians were in the habit of resorting from the interior to get supplies of mollusks, which they opened, smoked or dried, and laid up for winter use. Shell heaps are refuse heaps, the name given those on the Danish islands being Kjoekkenmoeddings, and the most common things found in them are of course like the most common indestructible refuse thrown from modern kitchens. Shells, and bones broken to extract the marrow, make up the great mass of the heaps, but there can usually be found with them, or near by, a few implements, weapons, ornaments, broken pottery, and even human bones, which may have fallen here by chance. Implements of stone and bone, for crushing open the edges of the shells and extracting the meat, are the relics properly belonging here, and it is very unusual in examining a large shell heap not to find at least several of these stones. Near or upon these shell heaps may usually be found black spots frequently surrounded by blackened stones, where the natives were in the habit of making their fires and cooking their food. Pieces of charcoal, even, may sometimes be found in the midst of these black heaps of ashes, and I have several times had good success in hunting for fragments of broken pottery near these old fire-places.

The shells composing the shell heaps of Cape Cod, Martha's Vineyard, and Nantucket are mostly quahoags, oysters, clams, both the small kind and the large sea clam, fragments of razor shells, conches, periwinkles, a few scallops, and the large salt-water snail shell so commonly found clinging on rocks. At Edgartown, Martha's Vineyard, near the "Swimming Place," and at one other place on Cape Cod, are found large numbers of land snail shells in little piles in the midst of the shell heap, which leaves little doubt that the Indians did not hesitate to eat even these when they could collect them in large enough numbers. It is possible that they were collected with a view to pierce and string them, for they would make better ornaments when strung than ordinary periwinkles. On Indian Neck, in South Wellfleet, Mr. Theophilus Rich, a few years since, while digging, found the skeleton of an Indian which was apparently, when first uncovered, well preserved, but soon crumbled all away excepting the jaw-bone and teeth and a double row of common periwinkles which had hung about the neck and rested on the chest. The teeth were worn down close to the base, or were, as the discoverer affirmed, "double all the way around." Among the quahoag and periwinkle shells near the oldest shell heaps lying to the north of Wellfleet Harbor were found some which had been perforated from within outward, ostensibly for the purpose of stringing. It was possible to tell roughly which shell heaps were the older, because some of them had the quahoag shells in them dented on the edges or broken in pieces by hammer stones, while in other piles which in other respects appeared equally old it could be seen that the quahoag shells had been opened by a knife, which could be inserted to cut the strong adductor muscle and thus avoid breaking the shell. One shell heap, a very short distance from the most western large wharf, on the north side of Wellfleet Bay, was especially interesting from the fact that here occurred the shells of the long narrow native oysters, now extinct on the New England coast, but whose shells make up by far the larger part of the great shell heaps of Maine. It is a rare thing to find these oyster shells so far toward the south, and a few of them discovered some years ago in the mud about Back Bay, Boston, are said to have created considerable comment at the Boston Natural History Rooms. The shells in the heap were very old, and the larger ones crumbled so easily that only one was preserved. Soon after the examination of this shell heap, Mr. Graham, living near by, showed a very fine large specimen of this oyster's shell which he said he dredged up in the bay. Both valves were perfect, and looked as if the occupant had just removed. The owner of it saw that it was very rare, and he refused an offer for it of $5. If it is true that this variety of oysters was once common along the coast of Cape Cod, and yet a thorough search should prove that the shell heaps of Cape Cod contain very few of them, will it not help to establish the fact that the Indians have not plenti fully inhabited Cape Cod till a comparatively recent time? On Cape Cod scattered shells and a thin layer of rich black earth, often containing a few stone chips, are found in the vicinity of nearly all Indian towns where the ground may have been fertilized by the natives for their crops, or where the soil was already best for their cultivation. This layer is usually from 6 inches to 1 foot below the surface, but in one or two places it occurred fully 2 feet down. This depth does not necessarily make the time of accumulation great, for the sand of Cape Cod is noted for its habit of shifting about under the action of the wind, and in some places, where arrow-heads occur most plentifully, the wind has removed all the sand which may once have covered them, and has left them on a smooth gravelly surface, where they may be easily seen. The writer was drawn to an examination of the "drift gravel" of the cape by the success which Dr. C. C. Abbott had in finding stone implements, &c., in the gravel near Trenton, N. J., but none have been found except where a bank had washed away, and the implements which belonged in the layer of soil above had sunk down into the gravel, and been covered up there by later slides. The laws which govern the distribution of Indian camps on Cape Cod, Martha's Vineyard, and Nantucket are much easier to apply than those which govern the distribution of our villages in the same regions. It is possible to predict with considerable certainty where will be found remains of Indian settlements. Indians did not dig wells, and they were largely dependent for food upon the fish and shell-fish which they caught at the mouths of streams and sheltered bays. Therefore they almost invariably chose a sheltered spot, near the shore of some indentation of the coast, or on some stream leading from such indentation. This they did for convenience in bringing their fish and shell-fish to their camps, which were placed as near as possible to a fresh-water stream or pond to obtain a ready supply of drinking water. It was an easier thing for them to adjust the position of their homes conveniently to these supplies than to bring them any distance to their homes; and so these matters were considerations of prime importance to them in selecting a camping ground. Accordingly the ponds or brooks in the vicinity of bays that supply shell-fish and quiet fishing-grounds, help us to find vestiges of Indian settlement, provided they have not since been destroyed by cultivation of the ground. This method has proved very successful on the parts of Cape Cod visited, and if followed up further in the vicinity of Chatham Harbor, Barnstable Harbor, and the numerous inlets on the Falmouth shore, would probably bring to light many more shell heaps.

The largest shell heaps found were about Wellfleet Bay, Bass River, Centreville River, and Buttermilk Bay, the exact spots being marked upon the map. In the vicinity of Wellfleet Bay, especially where the wind has taken all the soil from the rounded tops of the hills, the visitor cannot fail to notice the scattered shells and numberless chips of quartz and porphyry marking the spots where the "ancient arrow maker" sat. Mr. Graham speaks of one man who went carefully over these hills, a few years ago, and collected in three days arrow-heads and other Indian relics which he sold for $15. There are still many imperfect arrow-heads, broken or unfinished, with numberless cores, chips, and hammer stones; but the best specimens have evidently been picked up in most of the places visited in the vicinity. It is fortunate for the collector of to-day in these regions that the soil of Cape Cod, Martha's Vineyard, and Nantucket is very sterile in many places, and there is no accumulation of rich vegetable mold to attract cultivation or cover Indian relics such as exist at Mount Hope, R. I., and a few other celebrated Indian regions. The following list gives a summary of objects found during the days of the past two summers collecting on Cape Cod, Martha's Vineyard, and Nantucket.

It must be first understood that with the exception of a visit of three days to Chilmark, Martha's Vineyard, all were obtained in a few hours' search, while on an excursion of a day each to these islands. At Wellfleet the writer camped three days with his brother, who assisted him in the search. The list cannot be specially interesting except to give an idea of what may still be accomplished in a very short time in collecting Indian relics in a State where such things are now generally supposed to be very rare.

In the vicinity of Bass River, between Yarmouth and Dennis, were found a stone ax-head, with a deep groove for receiving the withe or thong by which it was fastened to the handle; two stone drills for boring; a piece of stone 6 inches by 4 inches, chipped roughly to an edge all around, and probably used as an ax or hoe; a large fragment of a soap-stone pot, with handle or ear attached; thirty arrow-heads.

Harwich.—Forty arrow-heads and 4 spear-heads; a polished celt of jasper; an unpolished hatchet, or tomahawk, of gneiss; pieces of soapstone pottery, also pottery of clay baked with pounded shells or coarse sand; bones broken in lengths, and charcoal in fire-places; a piece of graphite worn by use in marking.

Buttermilk Bay (at the head of Buzzard's).—Twenty-five arrow-heads of quartz and porphyry, and 1 of brass; 1 broken stone knife.

Chatham (near Taylor's Pond, in South Chatham).—A water-worn pebble, of good quality graphite, 2 inches long and 1¼ inches wide, given by a friend, who found it beside a shell heap.

Brewster.—Among some chips of stone made by the Indians in arrow-making, and collected by a friend, was one of siliceous chert, evidently from a limestone region. In the center of the siliceous portion was a minute spiral-shaped fossil shell.

Centreville.—Twelve stone arrow-heads, 2 spear-heads, and 1 arrow head of brass.

North Truro.—Two arrow-heads, 3 spear-heads.

West Yarmouth.—Three arrow-heads.

Cotuit.—Two arrow-heads. On Oyster Island, in the harbor, 2 arrow-heads and part of the skeleton of an Indian.

Cataumet.—One arrow-head.

Wellfleet and South Wellfleet.—Five hammer stones, a number of cores, over 200 arrow-heads, 3 spear-heads, good pieces of clay pottery, a pipe-stem, and a club-head of syenite with a deep groove all around to fasten it to a handle, as seen in the club of the Massachusetts Historical Society's collection.

At Assawamsett Pond, Middleborough.—One arrow-head and two fine pestles.

Nantucket.—Thirty-three arrow-heads, 10 cores, 3 spear-heads, 1 celt of sandstone, and one gun-flint.

Martha's Vineyard, Chilmark.—Ten spear-heads, 48 arrow-heads, and 3 hammer-stones.

Edgartown.—Fifteen arrow-heads, 2 hammer-stones, and 1 flake of stone with edges trimmed up as a minute celt, or scraper.

Some of the spear-heads were of the type called leaf-shaped implements, but a few of them were much larger, and would have made formidable weapons in a fight. Many of the arrow-heads and some of the spear-heads would not be preserved by some collectors; but they are saved, because they illustrate different stages of completion, from the core, out of which only one or two chips have been broken, down to the finished specimen off which not another chip could be taken without injuring the symmetry. Other specimens have been cast aside when nearly finished, owing to some imperfection in the stone itself, and, in one case, occurred several arrow-heads roughly blocked out and left in a pile, evidently with an intention, on the part of the maker, to finish them up at his leisure. The vessels found on Cape Cod are of three sorts: First, those made of soap-stone; second, and most abundant, pottery made of clay mixed with pounded shells and baked after the proper shape had been given by molding the clay in a basket. The basket was burned away, leaving the outer surface much better baked and, in consequence, far redder than the dark clay within. The outer surface bore the imprint of the wickerwork of the basket, and the inner surface the marks of some tool used in applying and shaping the clay with which the basket was lined. The clay must have been applied in three layers, for the broken shells in the center never appeared on the surface to weaken the pottery or mar the beauty.

The third kind of pottery was made of clay and coarse sand uniformly mixed, and did not appear as tough and well baked as the preceding variety. Among the articles of Indian manufacture found on Cape Cod care was exercised to discover any indications of an ancient aboriginal trade by which the Indians may have been supplied with articles which they could not obtain in their vicinity. With the exception of the single flake of stone from Brewster containing a fossil shell, all the material from which arrow-heads were made upon Cape Cod, Martha's Vineyard, and Nantucket, might have been collected on the spot; although one variety of jasper of which are made a good number of arrow-heads seems to be very rare in this region.

Several pestles found on Cape Cod, and one from Middleborough, were made of a slate, belonging in the Carboniferous group, occurring abundantly in Rhode Island, and from which several pestles in the collection of Brown University are made.

Besides these pestles the most interesting objects, which point to some sort of trade or an exchange by force between these Indians and the Narragansetts or some other tribe, are the broken pots of steatite, or soap-stone, found at Bass River, Winslow's Narrows, and Harwich Port, and the pieces of graphite found at Taylor's Pond and Harwich Port.

The Narragansetts are mentioned first, because they were noted for their industry in manufacturing and exchanging articles with other tribes, and a comparison of the specimens from Cape Cod with some obtained this summer in Rhode Island lead to the belief that both the graphite and the soap-stone came from that region also.

This summer the famous ledge of soap-stone at Johnston, R. I., just outside of Providence, was visited. To this the Indians must have resorted for years to obtain material for their stone pots and pipes.

Rev. Fred. Denison, of the Rhode Island Historical Society, and one of the committee chosen to preserve this interesting relic, has published a circular which describes the condition of the quarry when first discovered. Extracts from this circular, prepared by Mr. Denison, will be given to show the importance of this quarry to the aborigines.

"This largest excavation measures about 10 feet in length, 6 feet in width, and now 5 feet in depth. From the top to the ledge, as left by the glaciers, the excavation must have been carried down about 15 feet or more, inasmuch as, when it was opened, there lay across its top a fallen slab of slate-stone that once stood full 10 feet high above it, forming its eastern wall.

"The excavation was found partly filled up with dirt, *débris* of Indian art, some whole stone pots, some partly finished pots, some only blocked out, numerous stone hammers, and a few shells. Many of these valuable relics have passed into private hands and are highly prized. The sides and bottom of this excavation contain about sixty distinct pits and knobs of places where pots and dishes were cut from the rock, while all parts bear marks and scars made by the stone implements of the swarthy quarrymen. From the excavations and their surroundings have been removed about three hundred horse-cart loads of the stone chips left by the Indian workmen, yet some have been preserved by Prof. J. W. P. Jenks, in the museum of Brown University." In the possession of a friend on Cape Cod, is a broken soap-stone pipe which he found at Harwich Port. In Rhode Island a perfect stone pipe of this same pattern was seen. The handles or ears on some of the pots found at the quarry above described, were exactly like the handle on a piece of a stone pot found at Bass River. With the additional evidence that the stone itself is similar in the two places there can be little doubt that the Johnston, R. I., quarry supplied the Cape Cod Indians with their stone pots and pipes.

The only other interesting implements or weapons which were once in the possession of the Cape Cod Indians and found along with their other weapons of stone were two arrow-heads of brass, one of which the writer's brother found at Buttermilk Bay, and the other was discovered by the writer at Centreville, while hunting for Indian relics. They are of very thin evenly wrought brass sheathing, and a notch in the edge of the one from Buttermilk Bay suggests that they were cut out by a metallic knife or shears with a good cutting edge. The one from Centreville and another which Professor Putnam found at Revere, Mass., were both made on the same pattern as the arrow-heads found with the celebrated "skeleton in armor" discovered at Fall River, with the exception that the latter were pierced with holes for better securing them to the shaft.

It was the custom of the Indians of Cape Cod, Martha's Vineyard, and Nantucket, to bury their dead in a sitting posture, wrapped in bark and, if a warrior, supplied with his usual weapons. On the east side of Bass River, just above the lower bridge, while digging for a well, a man found two Indians buried in this way. One of them had buried with him a stone knife, spear, and arrows. The arrows were in a quiver which, with the wooden shafts, soon crumbled on exposure to the air. Other Indians have been found buried in this way on other parts of Cape Cod, at Martha's Vineyard and at Nantucket. At Cedar Pond, near Betty's Neck, in Lakeville, another one, "curled up" and carefully wrapped in bark, was exhumed. Soon after their contact with the whites the Indians gave up this method of burial. The writer has the skull of an Indian buried at Chilmark, Martha's Vineyard, soon after the whites settled on the island, the skeleton of which was lying horizontally amidst faint vestiges of a coffin. On the west shore of Oyster Island, in Cotuit Harbor, was found part of the skeleton of a large Indian buried in a sitting posture, but much disarranged by the sliding away of the bank which had uncovered it.

During the period in which the Indians were gradually changing from their old method of interment to that of civilized nations, it was their habit to bury with their dead, ornaments and weapons obtained from the whites, while, in other respects, the burial may have been exactly similar to that of their ancestors. There is an account of such a grave in Florida, where was found an ornament of gold, made from metal of about the standard weight of the coin taken to that coast by the first settlers. In another southern grave was found an old sword of the early settlers. Coats of mail were sent to the colonists in Virginia and Plymouth colonies, to defend them from their enemies, the Indians. Armor was used as late as the time of King Philip's war in 1675. The disasters connected with Indian warfare among the colonies, and the chance of lost or cast away armor falling into the hands of the Indians is enough, in my opinion, to explain the presence of some few pieces of armor in their graves without going back to the early times of the Northmen's explorations. The "skeleton in armor," discovered at Fall River, is minutely described in an article written by Mr. John Stark, and published in the third volume of the American Magazine, at Boston, in the year 1837. This account may also be found on page 124 of Barber's Historical Collections, with a drawing of the skeleton and armor in the position in which it was discovered. "The body was in a sitting posture and enveloped in a covering of coarse bark of a dark color. Within this envelope were found the remains of another of coarse cloth, made of fine bark and about the texture of a manila coffee bag. On the breast was a plate of brass 13 inches long, 6 broad at the upper end, and 5 at the lower. It was oval in form, the edges made irregular, apparently by corrosion. Below the breast plate and entirely encircling the body, was a belt composed of brass tubes, each four and a half inches in length, and three-sixteenths of an inch in diameter, arranged longitudinally and close together; the length of a tube being the width of the belt. The tubes are of thin brass, cast upon hollow reeds, and were fastened together by pieces of sinew. This belt was so placed as to protect the lower parts of the body below the breast-plate. The arrows are of brass, thin, flat, and triangular in shape, with a round hole cut through near the base. The shaft was fastened to the head by inserting the latter in an opening at the end of the wood, and then tying it with a sinew through the round hole—a mode of constructing the weapon never practiced by the Indians, not even with their arrows of thin shell. Parts of the shaft still remain on some of them. When first discovered the arrows were in a quiver of bark, which fell to pieces when exposed to the air."

The skull and a few other bones of the skeleton were much decayed, but the upper viscera were entire, and the flesh and skin on the hands, arms, one knee, and a part of the back were in a good state of preservation, though the skin looked black as if it had been tanned. In connection with the discovery of this skeleton in armor, this writer mentions the fact that the famous Dighton Rock, bearing an inscription "of which no sufficient explanation has yet been given," lies on the edge of a river but a short distance away, and that near this rock brazen vessels have been found. All these signs seem to him to indicate that some mariners—the unwilling and unfortunate discoverers of a new world—lived some time after they landed, and, having written their names, perhaps their epitaphs, upon the rock at Dighton, died and were buried by the natives.

In the summer of 1882 the writer learned that some few years before, the skeleton of an Indian had been discovered in Centreville by some workmen while making the cellar of Captain Crawford's house. Buried with this skeleton was found a breast-plate of brass. Last summer it was learned from Mrs. Crawford that such a breast-plate had been found, but that it had disappeared, she knew not where. She remembered few particulars in regard to the position of the skeleton and any coverings that might have been on it, but remembered well holes near the edges of the breast-plate that had probably once been occupied by rivets or strap buckles to fasten it to the body. She felt sure it was an Indian, because all around the house on the sides of the little hill upon which the house was built there was an abundance of stone chippings and arrow-heads, and once a queer Indian pipe-bowl had been found. On the rear side of the little hill a good number of quartz and porphyry chips were then picked up, and at the house next door a fine leaf-shaped implement, which had been picked up on this hill, was exchanged for an old jack-knife. The first white explorers that visited New England found considerable copper in the possession of the natives which was used chiefly in the form of ornaments, but sometimes to head their arrows. Very soon, even before Gosnold or the Pilgrims arrived, the Indians had in some way obtained brass of the traders and fishermen who visited their shores.

In "Mourt's Relation or Journal of a Plantation settled at Plymouth in New England" we hear of arrows curiously "headed with brasse, some with Hart's horne and others with Eagle's claws." Another writer, sending home to England an account of the settlement at New Plymouth, says of the Indians: "For their weapons they have bowes and arrowes, some of them headed with bone, and some with brasse: I have sent you some of them for an example."

The following account of some copper articles in the possession of the Indians is taken from John Brereton's "Brief and True Relation of the Discovery of the North Part of Virginia, being a most pleasant fruitful and commodius soil." Brereton was with Gosnold when he discovered Martha's Vineyard in 1602. Even then they found an European rigged boat, the work of some Frenchmen, in the possession of the Indians of New England. From these Frenchmen, or other traders and explorers, the articles of "paler colored metal" described by Brereton as in the possession of the Indians that visited them while staying at Cuttyhunk may have come. The Indian probably told Brereton the truth in regard to the copper, which might have been dug up in some places in Connecticut or New Jersey, for afterward in these places the first white settlers sometimes found pieces of native copper, and even mined it, at the junction of the trap and red sandstone. Brereton's account of the metal found in the possession of the Indians is as follows:

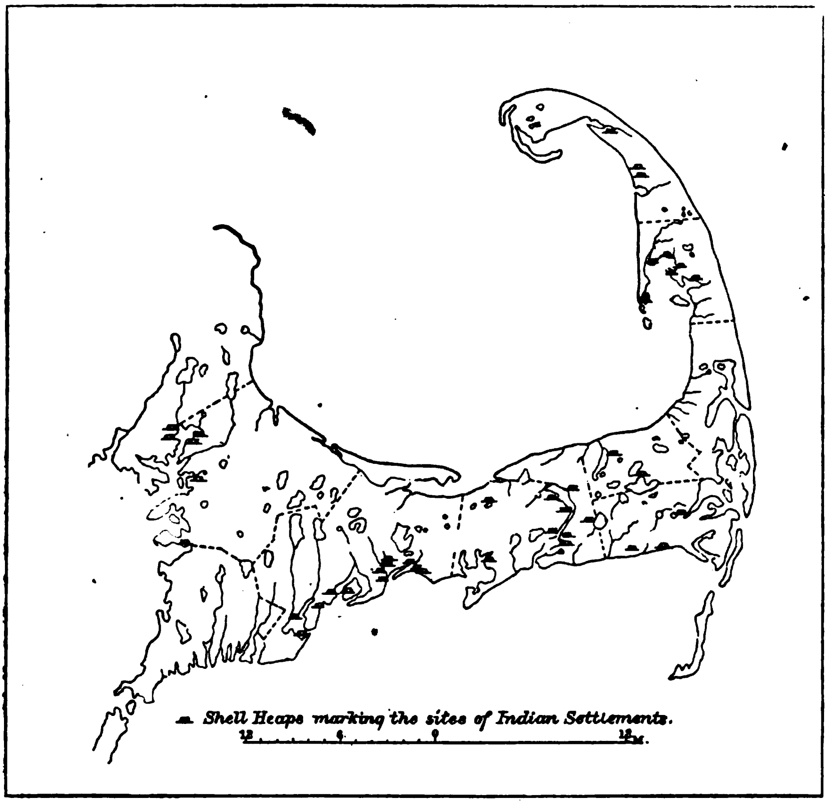
"They have also great store of copper, some very red and some of a paler color, none of them but have chains, ear-rings, or collars of this metal. They head some of their arrows herewith much like our broad arrow-heads, very workmanly made. Their chains are many hollow pieces cemented together, each piece of the bigness of one of our reeds, a finger in length, ten or twelve together on a string, which they wear about their necks. Their collars they wear about their bodies like bandoleers, a handful broad, all hollow pieces like the other, but somewhat shorter, four hundred pieces in a collar, very fine and evenly set together. Besides these they have large drinking-cups made like skulls, and other thin plates of copper much like our boar spear blades, all which they so little esteem, as they offered their fairest collars or chains for a knife or such like trifle, but we seemed little to regard it. Yet I was desirous to understand where they had such store of this metal, and made signs to one of them with whom I was very familiar, who, taking a piece of copper in his hand, made a hole with his finger in the ground and withal pointed to the main from whence they came."

With a knowledge of this custom of the Indians, that is, of stringing tubes of copper or brass in the form of wide belts and wearing them about the waist, the discovery of such a belt on the skeleton at Fall River buried in other respects like any Indian (with the exception of the breast plate) need not seem so strange, especially when we find that brass and copper were quite abundant among them at an early date, and one other Indian at least had come into possession of a brass breastplate.

Before the Pilgrims landed on Cape Cod it is certain that the Indians there had killed three Englishmen, and killed or retained as slaves the whole ship's crew of a French vessel which landed there in distress. This they did for the sake of plunder, and very probably some copper or brass came into their possession at these times. Granting, then, that the Indian whose skeleton was found at Centreville did not engage in successful war with the colonists, or get the brass breast-plate from them by trade, it is still possible for him to have obtained it, or the material for it, at a still earlier date from these unlucky explorers.

An account of the burial customs of the Indians on Cape Cod would be imperfect without reference at least being made to the description of an Indian burying ground discovered by the Pilgrims while exploring on Cape Cod before the settlement at Plymouth. This account may be found under the history of Gov. John Carver, in a book compiled by J. B. Moore, entitled "Governors of New Plymouth and Massachusetts Bay."

The place where Governor Carver and "nine of his principal men, well armed," landed after leaving the Mayflower and rounding the point off Wellfleet Harbor, was probably on Indian Neck, where, it will be seen by consulting the map, many Indian shell heaps may now be found. On the shore Carver and his men saw ten or twelve Indians engaged in cutting up a large fish, but found it difficult to go directly to the shore where the fish lay, on account of the shoal water. The Indians ran off, taking with them all the fish they could carry. The shores of the shallow bay or cove in which they landed were almost lined with the remains of large fishes like that which the Indians had cut up. The fish proved to be a grampus, and so the explorers called the bay Grampus Bay. This bay is now called Blackfish Bay or Creek, and it is only a few yards to the north of this shallow bay that the shell heaps and other signs of Indian settlement, before described, around Drummer Pond may be found. With this explanation and a reference to the map, the history of the discoveries made by the Pilgrims at this time may be more interesting, and should be read among the very first books by those who wish to become better acquainted with the history of the Indians in this vicinity.



Sketch-map of Cape Cod, Massachusetts.

The traditions of the Indians of Cape Cod, Martha's Vineyard, and Nantucket have been wholly omitted in these notes, but may be found in full, together with many interesting facts in regard to the Indians' dress, wigwams, canoes, &c., in a few books the titles of which will soon be given.

The fable in regard to the lignite and fossil bones of cetaceans or whales found abundantly in the Tertiary clay of Gay Head, Martha's Vineyard, is very interesting. These Indians supposed that the blackened wood or lignite marked the spot where the giant Manshope broiled the whale on a fire made of the largest trees, which he pulled up by the roots. The rest of the tradition is very interesting, but if repeated would necessitate entering on the almost equally interesting traditions of the Indians of Nantucket and Cape Cod.

Mr. Treat wrote that there were in 1693 under his care in Eastham, which then included Wellfleet and Orleans, four Indian villages where he was in the habit of visiting the natives in their wigwams. At this time there were five hundred adult persons in the villages; but notwithstanding every exertion made for the benefit of the Indians, they wasted away by fatal diseases and other causes, so that in 1764 they were reduced to four individuals only.

One reason why so few traces of settlement can now be found on the sites of these old Indian villages is undoubtedly owing to the fact that the civilized Indians persistently kept up the custom of living in wigwams until they had become wholly extinct or had mixed with other races. As late as the year 1779 there was a cluster of wigwams about a mile from the mouth of Bass River, probably at the spot where the shell heaps and arrow-heads are so abundant. About this time the small-pox was prevalent and most of them died.

In 1745 thirteen Indians from this company on Bass River and the immediate vicinity accompanied the Cape Breton expedition. The condition of their embarking was that Mr. Thacher, of Yarmouth, should be their captain. Of these thirteen only three lived to return, two being killed by the enemy, and eight dying of disease. One of Thacher's Indians, hired by Colonel Vaughan for a bottle of brandy, was the first of the provincials who entered the grand battery at Louisburg. He crawled in at an embrasure and opened the gate, which Vaughan immediately entered, the enemy having withdrawn from this battery, though at the time this circumstance was not known. This information is from an extract made from "Alden's Collection," on page 60 of Barber's *Historical Collections*, and it adds several other interesting stories of the Indians of this vicinity.

Very little interesting information exists about the Indians of Centreville and Buttermilk Bay, where the shell heaps would indicate a population nearly as great as that at Bass River and Wellfleet Bay.

Until the breast-plate of the Skeleton in Armor is found, and a thorough investigation can be made, the history of this warrior must remain a mystery, and we may regard him as a very ordinary and vain Indian, buried in his finery, or we may think of him as a successful warrior safely returned from a secret participation in King Philip's war, and afterwards buried in the spoils which he had stripped from a fallen foe.

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ANTIQUITIES FROM OMETEPE, NICARAGUA.

By CHARLES C. NUTTING.

Although the name of this island has been spelled "Ometepec" by previous explorers, I have decided to adopt the spelling of the inhabitants of the country, which is also that used in official papers.

This latter fact I discovered through reading official reports of the eruption of the volcano published in "El Centro Americano," a Nicaraguan newspaper. This island is situated about 9 miles from the town of San Jorge on the west shore of Lake Nicaragua. It is about 20 miles long by 10 wide, and the greater part of its surface is covered by two volcanoes, which are prominent features of the scenery from all parts of the lake.

The Volcano Madera is of greater bulk than its companion and much more irregular in form. So far as I could learn it has never been known to give signs of activity within historic times.

The Volcano Ometepe, situated on the northern end of the island, is said to be one of the most regular in form in the world, being a perfect cone from all points of view. It is about 5,000 feet high.

This has also been considered an extinct volcano, but, during my visit, it began showing signs of activity. On March 6, 1883, a thin column of smoke was seen to issue from the exact summit, and about six weeks afterward there was a slight flow of lava on the southeastern side.

Ometepe has the reputation of having been an object of worship by the peoples of past ages, and the large number of stone images found on the island would seem to indicate that it was sacred ground. It was evidently a chosen spot for burial, as the immense number of graves and burial urns still testify.

The present inhabitants of the island are mostly Indians of a rather purer type than is found on the adjacent mainland, although many of them show a mixture of Spanish blood and a few are partly negro.

For a description of the appearance of the pure-blooded native, I can not improve upon that given by Dr. J. F. Bransford, in his "Archæological Researches in Nicaragua," page 6:

"In physique the Indians are usually rather short, low-browed, with dark copper skin and coarse hair. On and near Madera are a few of commanding stature, many of the men being over 6 feet high and the women proportionately large. The head is short, the features strongly marked, with heavy lower jaw and large teeth."

I was unable to discover any remnant of reverence among the natives for the old idols found on the island, nor did they offer the slightest objection to the removal of one of them, although they were convinced that said removal was simply a freak of insanity on my part.

One prominent characteristic of these Indians is the deference and obedience which they pay to the opinion and will of their wives, whom they consult on all matters of importance.

This fact is well illustrated by an instance which is, perhaps, worth recounting.

While digging for antiquities the writer found a spot peculiarly rich in the objects of his search, but it was on land owned, or at least worked, by an Indian who proved unusually avaricious and demanded payment for every yard of earth disturbed.

He also put in a bill for damages done to his crop of young plantains by my men passing over them on their way to and from work. I considered the bill a just one and offered to pay it while settling up my other accounts, when, to my great surprise, he refused to accept the money. Upon being pressed for a reason he said that his "mujer," or "woman," had forbidden his taking the money.

In order to test the extent of his obedience I urged him to take the money, telling him that his "mujer" need know nothing of the matter. He steadily refused, however, and gravely stated that "women knew everything."

The Catholic Church is here, as elsewhere in Central America, the controlling power among the Indians. But they still retain some curious remnants of their own ancient superstitions, among which may be mentioned an almost universal belief in the *personality* of the great forces and features of nature.

They attribute life and passion to Lake Nicaragua, for instance, not only in a figurative but also in a literal sense.

This power of ancient superstition was well illustrated by an instance which occurred during my ascent of the Volcano Ometepe.

This ascent was made at the request of the " alcalde " of the town of Moyogalpa, who furnished me with six men to carry water and provisions.

After entering the dense forest which clothes the summit of the peak, I became convinced that the men knew nothing about the trail, and accordingly determined to make a way for myself and, selecting the most intelligent of the men for my companion, I pushed on ahead leaving the others to shift for themselves.

After toiling upward for an hour or so, wishing to ascertain the whereabouts of the rest of the party, I asked my companion to shout, and see if they were within hearing. He seemed extremely reluctant to do so, and I gave the call myself, much to his evident alarm.

After shouting several times without any response, I was informed by the Indian that my efforts were useless as the others wouldn't answer even if they heard me.

Upon inquiring the cause of this, I was told that they were "afraid to make a noise so near old "Ometepe" as it might make him "muy bravio" (very angry)!

I found, upon rejoining the others shortly afterward, that it was even so, and that my calls were plainly heard, but not answered for the reason given.

The Indians are good-natured and indolent, as a rule, and rarely quarrelsome or dangerous, except when under the influence of liquor. I found it much easier to lead than to drive them. Their good-will is readily gained, and more can be accomplished through that than through either fear or money.

The antiquities secured by me may be divided into two general classes: (1) Sculptures in stone; (2) Vessels of clay and their contents, including all objects found in the burial places.

Among the stone sculptures I saw a number of human figures about life size, besides smaller articles comprising images of men and animals, and also utensils such as grinding stones and vessels for various purposes. I saw and examined seven human figures carved in stone and of nearly life size.

No. 1. A large human figure, sitting, about 5 feet high. The head, upper arm, and knee are wanting. Found lying, half embedded in the gravel on the lake shore, about 3 miles north of Moyogalpa. This is probably the figure referred to by Dr. Bransford as "an image without a head lying in the edge of the lake."

No. 2. Companion to the last, about the same length, but of slighter build, from which I judge that it was intended for a female. This figure also differs from No. 1 in having the arms bent at the elbows with the hands resting on the knees, while in No. 1 the hands hung down straight at the sides. Both Nos. 1 and 2 are headless, and the latter is probably the one referred to by Dr. Bransford as follows: "Another was said to be uncovered at low water during the dry season." At the time of my visit the figure was lying in the water, by which it was nearly covered.

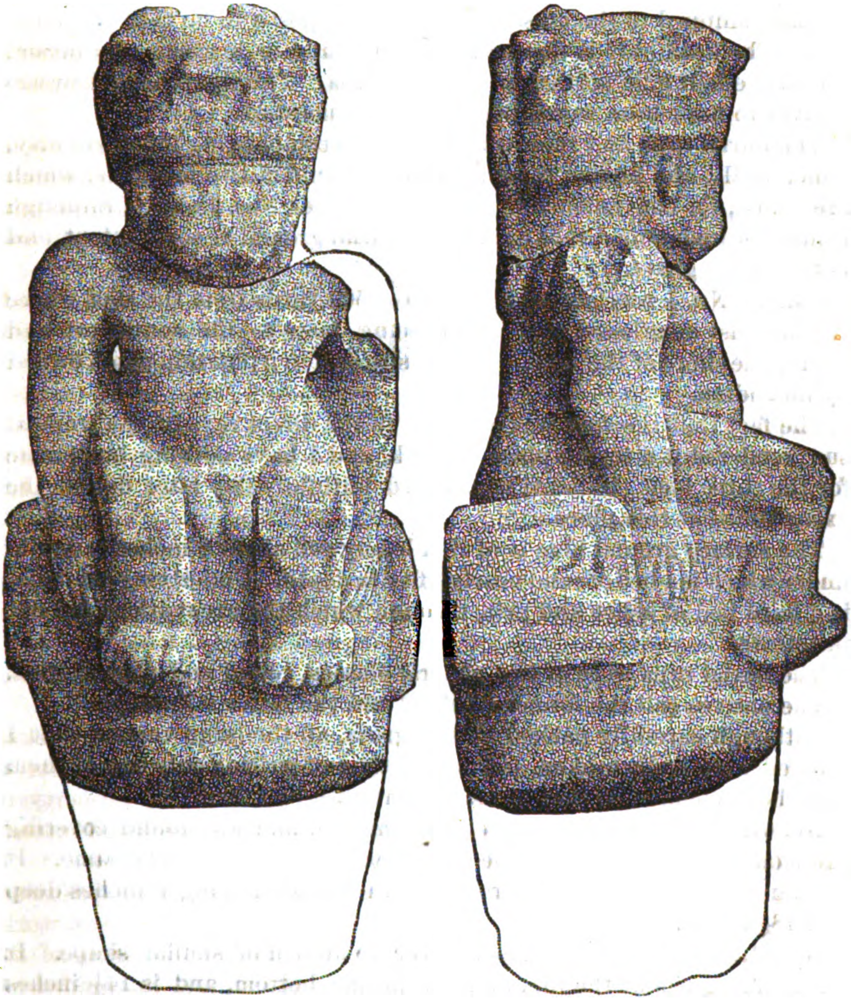
Nos. 3 and 4 are Dr. Bransford's Nos. 1 and 2. They have been taken from their original position in the forest and set up as gate posts at the Catholic church at Los Angeles. They are now the property of Dr. Earl Flint, of Rivas, who bought them from the church and intends shipping them to this country.

No. 5 is a very much worn figure of "a man in a standing position." The basalt rock is worn almost smooth, but it bears evidence of workmanship. I must confess that I could not make out the figure of the man, and give it as such on the authority of the native who guided me to it.

No. 6 was a seated female figure found in the dense forest south of Los Angeles. This figure also was headless, and I failed to find the missing part.

No. 7 was the companion to the last, and in better condition than any of the others I examined. The head was off, but I found it lying near, and found that it fitted well, having been broken off at a comparatively recent date. This figure I determined to secure for the National Museum, and succeeded in transporting it down to the lake shore, across the lake and over the mountains to the Pacific coast, where I placed it in charge of the Pacific Mail Steamship Company.

The idol is now in the National Museum at Washington, and forms the subject of the following illustration:



Front and side view of stone figure from Ometepe. (Size=$\frac{1}{12}$.)

The figure is that of a man seated. It is about life size, but the legs are small in proportion to the body. The head is large and is surmounted by the head of some animal. The arms are separated from the body at the elbows and hang straight down.

The following are some of the measurements: Height of figure without base, 4 feet 3 inches; height of figure and base, 5 feet 9 inches;

width of seat, 2 feet 1 inch; height of seat, 1 foot 7 inches; sole of foot to knee, 1 foot 2 inches; arm and hand, 2 feet 1 inch; greatest girth of body, 3 feet 11 inches; greatest girth of base, 5 feet 11 inches; girth of neck under chin, 3 feet 6 inches; girth of arm, 1 foot 4¾ inches; height of head from shoulder, 1 foot 2½ inches; across knees, 1 foot 2¼ inches; knee to back of figure, 1 foot 10½ inches.

I also shipped to the museum a figure, supposed to be that of a monkey. The head only is distinct. It was found in a cacao plantation, about one-half mile northwest of Moyogalpa. This figure is said by the natives to have been worshipped by their ancestors.

The burial urns and their contents and accompanying objects of clay, bone, shells, and human remains were all found in two localities, which are called, for convenience in reference, graves Nos. 1 and 2, although it must be understood that each was a burial ground of some extent, and not a simple grave.

GRAVE NO. 1 was located some 400 or 500 yards from the spot where the idol last mentioned was found, being more to the southwest and nearer the shore of the lake. It was situated in a plantain patch owned by an Indian.

The fact that the spot was exposed to the direct rays of the tropical sun rendered it a trying place to work, and I have nothing but praise for the three men (Indians) who toiled faithfully day after day in the excavations at this place.

The surface ground here is of rich loamy soil about 8 inches in depth, under which is a bed of sand nearly 2 feet in depth. Underlying this sand is a hard bed of ashes and grit, through which the excavations did not penetrate.

The burial urns were of two general classes, round and shoe-shaped.

The natives call the former "*Ollas*," and the latter "*Burrugas*."

Although carefully packed in soft grass, all the large vessels that I secured were badly broken, and at the time of writing only two of them have been mended so that measurements can be taken.

No. 61,713 was the first vessel encountered, and was found covering the mouth of a large shoe-shaped urn, being inverted over the same. It is a large basin-shaped dish, round at the bottom, being 7 inches deep and 18¼ broad.

No. 61,712 was also used as a cover to an urn of similar shape. It has a flaring rim at the top, and foot at the bottom, and is 14¼ inches high by 18 broad at the top.

No. 61,714 was a rather small round urn.

No. 61,708. A shoe-shaped urn which is being restored.

No. 61,710 is a round deep urn.

No. 61,711 is a round medium-sized urn.

No. 61,709 is a shoe-shaped vessel.

No. 61,750 is a shoe-shaped vessel.

No. 61,707 is a small urn, made of the same material as the preceding. It resembles No. 61,712 in shape and measures as follows: Depth, 8½ inches; greatest breadth, 10½ inches.

These large urns were generally found at a depth of about 2 feet. The round ones generally had covers of material similar to the urns themselves, while the shoe-shaped vessels were more often covered with more delicate, painted bowls. Fragments of human bones were found in nearly every urn, but they crumbled at a touch upon being exposed to the air.

Many articles of more delicate construction and finer workmanship were found. They were often used as covers to the shoe-shaped urns, or buried near the latter, or placed within the urns, where bowls were sometimes found inverted over the scull of the occupant, apparently serving as a cap or protection to the head.

I was much surprised to find, in several instances, that bowls had been broken, and afterwards placed within the urns. This is proved by the fact that many of the bowls which were found in pieces inside of the urns were too large to pass through the mouth of the urn when entire.

No. 61,691. Bowl, painted on outside. Found inside of round urn. Depth, 3⅞ inches; width, 8¾ inches.

No. 61,692. Bowl, painted on outside. Found as cover for shoe-urn. Depth, 4⅛ inches; width, 9½ inches.

No. 61,693. Bowl, painted on outside. Found at a depth of 5 feet, inside of round urn containing skull. Depth, 4⅞ inches; width, 9 inches.

No. 61,694. Bowl, painted on outside. Found outside of urn. Depth, 4 inches; width, 8½ inches.

No. 61,695. Small bowl painted on outside. Two red lines around inside close to the top. Found inside of round urn. Depth, 3 inches; width, 5½ inches.

No. 61,696. Small bowl painted on outside. One indistinct red line around inside of urn. Found inside of round urn. Depth, 2¼ inches; width, 5 inches.

No. 61,697. Bowl with raised figure of human face on each side. Painted on the outside. A brown line around inside of rim with a red line immediately under it. Found covering a shoe-shaped urn. Paint very fresh. Depth, 4⅛ inches; width, 9½ inches.

No. 61,698. Bowl with raised figure similar to preceding. Painted on outside with a delicate pattern in fine lines and dots. Painted on inside with rather coarser pattern covering entire inner surface. Found covering a burial urn. Paint very fresh and distinct. Depth, 3¾ inches; width, 10 inches.

No. 61,699. Bowl with raised figure somewhat distorted. Painted inside and out with rather a ruder pattern than the last, and not so carefully executed. Colors remarkably fresh and distinct. Found outside of burial urn. Depth, 3½ inches; width, 8½ inches.

No 61,700. Shallow bowl painted inside and out with similar patterns. On the outside there is a series of twelve hieroglyph like figures of two kinds in alternation. On the inside are ten similar figures also alternating. This bowl is thicker and more solid in construction than any of the others. I have been unable to find another like it in the collection of the National Museum. It was found inside of a round urn where it served as a cover for a human skull. Depth, 2¼ inches; width, 7 inches.

No. 61,701. Shallow dish with flat bottom and flaring sides. Painted on outside simply in black and red lines broken by short vertical lines extending around its circumference. On the inside the design is much more elaborate, being more like that found on some of the larger bowls. This also was found inside of a round urn and had been used as a skull cover. Depth, 2¼ inches; width, 7½ inches.

No. 61,702. Shallow dish with bottom more rounded and sides more flaring than the last. Painted inside and out with very elaborate designs. Paint scaled off in many places. Found near a shoe-shaped urn. Depth, 1⅝ inch; width, 6¼ inches.

No. 61,703. Deep dish with rounded bottom and flaring sides. This dish is ornamented both inside and out with designs more intricate and elaborate than any other that I have seen from Ometepe. The colors are quite fresh and distinct. Found inside of round burial urn. Depth, 2 inches; width, 5⅝ inches.

No. 61,704. Deep, narrow-mouthed, bowl-shaped vessel ornamented on the outside with a series of red and black lines, and oblong longitudinal panels inclosing circular and square figures. Lower half of outside and entire inside not ornamented. Found inside of a shoe-shaped burial urn. Depth, 4 inches; width, 5⅜ inches.

No. 61,705. Deep, flat-bottomed, straight-sided vessel, painted red, and ornamented with incised lines on the outside near the rim. Found outside of burial urn. Contained human bones. Depth, 3⅝ inches; width, 6¼ inches.

No. 61,706. Two miniature shoe-shaped vessels joined together, facing in opposite directions with a handle on top (broken off). The two vessels are joined together inside by a round hole. This specimen is unique in the collections of the National Museum. Depth, 2½ inches; width, 4⅝ inches.

No. 61,744. Under this number come the numerous legs or feet of tripod vessels of clay encountered in all parts of the excavations. They almost always are made to represent the head of man or some animal, are hollow inside, and often have a little ball of hard clay within which makes a rattling noise when shaken. They are always painted in designs corresponding to those found on the vessels to which they belong. Although dozens of these legs were found I did not encounter a single entire tripod.

No. 61,745. Two vase ornaments representing heads of animals well executed and much more elaborate in form than the preceding. Unpainted.

No. 61,743. Clay "Sinkers." An intelligent native told me that he considered that these objects commonly called "sinkers" were, in reality, tools used for molding the various clay vessels with which they are associated.

No. 61,746. A small round fragment of painted ware, perforated so as to form a ring. Probably an ornament of some sort.

No. 61,747. Shell implement found in burial urn.

No. 61,748. Fish vertebra found in burial urn.

No. 61,749. Flint flakes found in burial urns. Said by the natives to have been used in fashioning the incised ornaments on pottery.

No. 61,715. Clay disc; I can think of no probable use whatever for this article. It is simply a round hard burnt disk 4½ inches wide by about ⅝ inches thick with rounded edges.

No. 61,716. Arrow-head found beside a skeleton which had been buried outside of burial urns, and stretched at full length with face up.

No. 61,717. Small portion of a semi-fossilized human bone, probably the ulna. Found inside of burial urn, at a depth of 5 feet below surface of ground. No. 61,693, was found in the same urn.

A great number of skulls and other portions of human skeletons were encountered both inside and without the urns. Those inside the urns were extremely fragmentary and crumbled at the slightest touch. I brought the fragments of a skull found at a depth of five feet along with Nos. 61,717 and 61,693.

I also collected a large number of bones from skeletons found outside of urns.

These seemed to be in a much better state of preservation, but were all jolted to pieces on the homeward voyage.

Some of these skulls are remarkably thick with a good facial angle.

It seems hard to account for these two modes of burial in the same spot.

Skeletons were often found stretched out right by the side of the urns.

The fact that those found outside of urns were in a much better state of preservation than those inside would seem to preclude the idea of the two modes being contemporaneous; the urns being an excellent protection for the latter. The indications are that a considerable lapse of time must have intervened between the two modes of burial, and that the urn burial is the older method, and that the full-length interment was practiced by a subsequent race. This subsequent race must have exposed the urns in digging their graves, and the question arises. Why were the urns left undisturbed?

Dr. Bransford has suggested to me the most plausible answer to this question which is substantially as follows: "All mankind, both savage and civilized, have a peculiar reverence for the graves of the dead, and, among many uncivilized races, this reverence has taken the form of a deep-rooted superstition which forbids the molestation of any grave. This was probably the feeling which induced the 'subsequent race, spoken of above, to leave unmolested the urns containing the remains of human beings."

GRAVE No. 2.—This place of burial was found at a spot only 200 or 300 yards northwest of Grave No. 1.

The character of the ground is much the same here as at No. 1, but the urns were found much nearer the surface, the tops of the vessels generally coming within a foot of the surface of the ground.

Most of the large urns were broken by roots of trees which had penetrated them in all directions, but they seem to be of the same style as those found in No. 1, with perhaps a little more attempt at ornamentation.

No. 61,737. A large, ornamented, shoe-shaped urn, much like No. 22,343 of Dr. Bransford's collection in size, shape, and ornamentation.

No. 61,738. A very large round urn which I succeeded in getting out of the ground intact, but it was badly smashed on the voyage.

No. 61,739. Medium-sized shoe urn, also badly broken. There was one vessel, badly broken by roots of trees, that had an ornamentation which I have not seen elsewhere among specimens brought from Ometepe. The vessel was about size and shape of Dr. Bransford's No. 22,320, but was rather more regularly formed. The ornamentation consisted in a regular, five-pointed star formed of raised lines. One of the points was missing.

The smaller articles of pottery from Grave No. 2 differ from those found at No. 1 in several important particulars. They have, in general, an appearance of greater age, and are more often ornamented with raised figures or designs. The painting is less elaborate and the paint much less fresh and distinct.

No. 61,718. Deep bowl, painted on the outside in a rather elaborate pattern. The design in color differs from that of similarly shaped vessels from Grave No. 1 in having the color laid on in bolder and more massive bands and patches. Shows slight traces of having been over the fire. Perhaps it was a vessel used in cooking. Depth, 3¼ inches; width, 6½ inches.

No. 61,719. Shallow bowl painted outside in a crude pattern, and inside in an elaborate one. Found in burial urn. Depth, 1½ inches; width, 4 inches.

No. 61,720. Large bowl with raised figures of human face on each side, the nose and mouth being much more prominent than in similar vessels from Grave No. 1. This bowl shows decided evidence of being subjected to action of heat, being scorched and blackened, and having a large proportion of the paint worn or scaled off. Painted in elaborate designs both inside and out. Found outside of burial urn. Depth, 4 inches; width, 9¼ inches.

No. 61,721. Narrow-mouthed pot or vessel, of peculiar shape. This peculiarity consists in a deep, broad groove extending from rim to bottom on one side. This may be a suggestion of the double shoe-shaped vessel, No. 61,706. Depth, 3½ inches; width, 4½ inches.

No. 61,722. Wide-mouthed bowl with an ornament consisting of a projecting turtle's head, well executed, on each side. It is ornamented also by broad raised bands, a flaring rim, a ring or pedestal for a stand, and three rings of incised dots, two of which rings extend entirely around the vessel, while the third is interrupted only by the turtle's heads. Colors red and perhaps originally black. Found outside of burial urns. Depth, 2½ inches; width, 5¼ inches.

No. 61,723. Bowl with flat bottom and slightly concave sides, and incised pattern running entirely around on the outside near the rim. Colored like preceding. Found outside of urns. Depth, 2⅛ inches; width, 5¼ inches.

No. 61,724. Hemispherical bowl with circular standard. Unornamented. Found outside of urns. Depth, 4¼ inches; width, 8 inches.

No. 61,725. Small, shoe-shaped vessel with raised ornament representing the face of some animal (tiger?). Black, polished. Found in urn. Depth, 4½ inches; width, 4½ inches; length, 5 inches; width of mouth, 2⅛ inches.

No. 61,726. Small, wide-mouthed shoe-shaped vessel. Unornamented and unglazed. Found outside of urn. Depth, 5 inches; width, 4¾ inches; length, 7¼ inches; width of mouth, 4 inches.

No. 61,727. Small, shoe-shaped urn, similar to last with the exception of a raised handle at small end. Front part missing. Found outside of urn. Depth, 5 inches; width, 4¾ inches; length, (?) inches; width of mouth, 3¼ inches.

No. 61,728. In form this vessel seems to be intermediate between the shoe-shaped and round styles. There is a slight vertical depression on the smaller end, and also two crescent-shaped ridges in imitation of the rope or chain ornaments found on the large, shoe-shaped urns. The material is either very old or poorly burnt, it being very "rotten." Depth, 5 inches; width, 6 inches; length, 7 inches; width of mouth, (?) inches.

No. 61,733. Diminutive, shoe-shaped urn, with raised ornaments at each end. Found in urn. Depth, 2¼ inches; width, 1⅝ inch; length, 2¼ inches; width of mouth, ⅞ inch.

No. 61,730. Similar to last. Unornamented. Found in urn. Depth, 2½ inches; width, 2 inches; length 2⅝ inches; width of mouth, 1¼ inch.

No. 61,729. Narrow-mouthed round vessel, with a series of vertical depressions and corresponding elevations running around the upper part. There is also a raised ornament, probably a head, on each side near the top. These ornaments are connected by a "rope ornament" extending entirely around the vessel. The combination of form and ornamentation is different from that seen in any other specimen from Nicaragua. Depth, 6¾ inches; width, 8 inches.

No. 61,731. Miniature of round urn, unornamented and unpainted. Found inside of round urn. Depth, 1½ inches; width, 1¾ inches.

No. 61,732. Same as last.

No. 61,734, 61,735. Ornaments from a large, curiously shaped dish which served as a cover for No. 61,738, but had been broken to pieces by roots. These ornaments were intended to represent the head of some animal, and show considerable care in design and execution.

No. 61,736. Beak of parrot in clay.

Many legs of tripod dishes were found, bearing a general resemblance to those of Grave No. 1. Very few bones were found, and those were even more fragmentary than in Grave No. 1.

No. 61,740 is a rude carving of a face in stone, found inside of burial urn.

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PAPERS RELATING TO ANTHROPOLOGY.

ANCIENT MOUNDS IN CLINTON COUNTY, MICHIGAN.

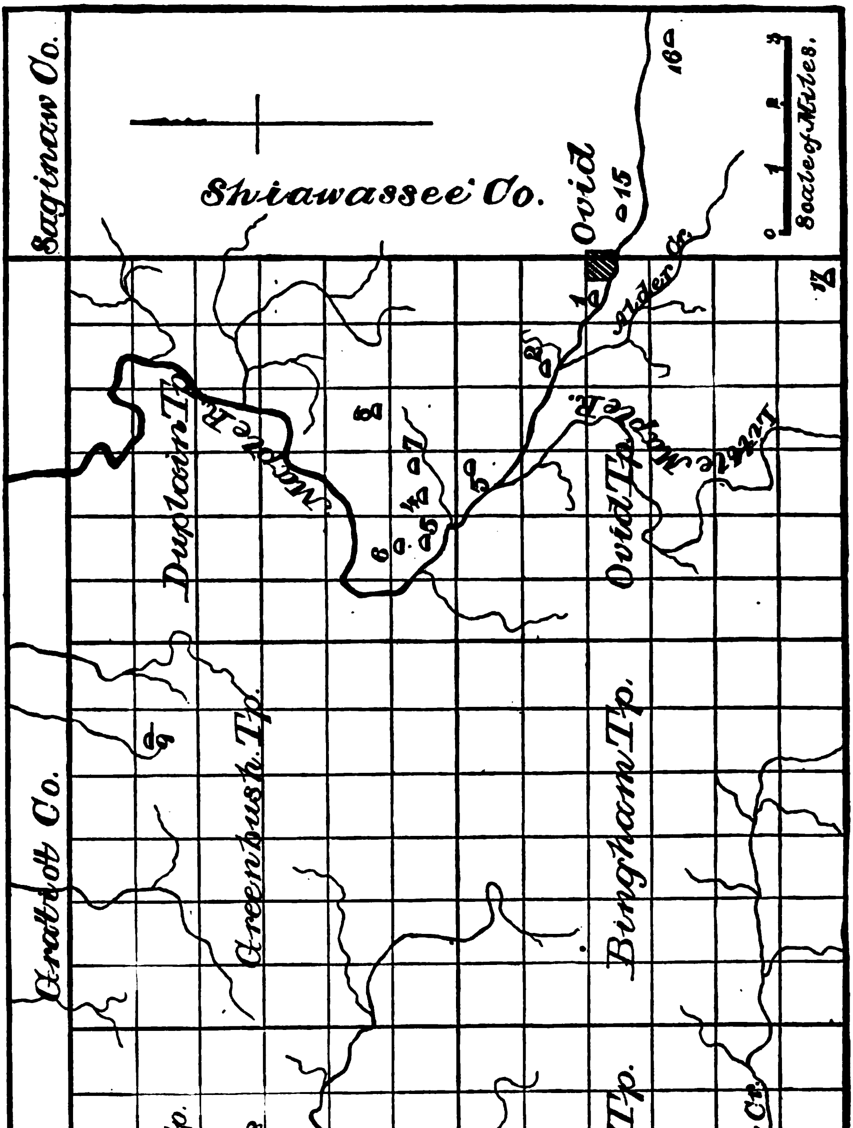
By M. L. Leach, *of Traverse City, Mich.*

Clinton County, occupying a central position in the Lower Peninsula of Michigan, is one of the most fertile portions of the State. The northern part of it is watered by the Maple River and its tributaries. The Maple is a small, sluggish stream. Rising in the central part of Shiawassee County, it takes a northwesterly course through the townships of Owosso and Middlebury, in Shiawassee, and Ovid, in Clinton; turns sharply to the northeast, then to the west, and finally to the north in the township of Duplain; crosses the boundary into Gratiot County, runs a westerly course for 13 miles, and re-enters Clinton near the northwest corner of the township of Essex.

It is only of the townships of Middlebury, Ovid, Duplain, Greenbush, and Essex that we have to speak in these notes. All the five townships lie wholly within the Maple River Valley. The surface of the country is gently undulating. There are no high hills or deep valleys. The land slopes down to the margins of the streams, generally without any well-marked terraces. There are some extensive swamps and marshes. The soil of the higher lands is a rich, sandy loam, easily cultivated, adapted to general farming, and remarkably well suited to the production of the cereals. When first settled by the white men, large portions were covered with heavy forests of oak, maple, elm, beech, basswood, and ash, with patches of pine interspersed; other parts were what is there called plains, being comparatively level, with an open forest consisting almost wholly of oak.

The Maple River Valley was the seat of a populous settlement of the Mound Builders. Their remains consist principally of burial mounds. These stretch in an irregular line, in a northwesterly course, from the township of Middlebury, through the most fertile part of the valley, to the northwestern part of Essex. The accompanying map is sufficiently accurate for practical purposes. I have taken great pains to ascertain the position of most of the mounds relative to the lines of the Government survey. When the location is given without qualification, it may be relied on as correct.

The mound on the southeast quarter of the southeast quarter section 36, in Ovid, marked 17, has entirely disappeared before the



Map showing mounds in northwest part of Clinton County, Michigan.

march of the white man's improvement. Mr. Hugh Swarthout, of Ovid, from whom I have the account, says it was 30 feet across at the base and as high as a man's head. Forty-three or forty-four years ago, he, with others, dug down in the center of it, and found bones at or near the natural surface of the ground. A tibia taken out was at least 6 inches longer than that of a man 6 feet high. The bones were all large. Though Mr. Swarthout is reliable, it is not safe to trust reports of big bones and other wonders, as I have learned by experience.

About the location of the mound there is no doubt.

Of the group of mounds in Middlebury I cannot give the exact location. I visited them once when called to the neighborhood on business, but took no notes. There were six or seven of them, all of which had been leveled by several years' use of the plow and harrow, but the site of each was still plainly discernible at a long distance.

From this group, passing down the Maple 2 or 3 miles, we come to another interesting group, marked 15 on the map, on the farm of Malcolm Fitch, about 1 mile east of the village of Ovid. In July, 1878, I visited this group, in company with my friend the late W. S. Trask, of Charlotte, Mich. With the assistance of Mr. Fitch's son, I took some rough measurements while Mr. Trask was sketching. There were six of the mounds, situated on level, sandy land, in a beautiful grove. The largest was 34 feet in diameter at the base, circular, and well rounded up. It was 4 feet high, but the height may have been somewhat increased by the earth thrown out of an excavation in the center by some explorer. A portion of a tree which had grown on the mound was still lying upon it. It was 2 feet or more in diameter. Mr. Fitch said it must have fallen down before he came to the place, twenty-seven years previously. Southeast of this first mound, at a distance of 18 feet from its base, we came to the base of another. It was somewhat irregular in shape, being 50 feet long from east to west, 30 feet broad, and from 2½ to 3 feet high. Mr. Trask suggested that the two mounds were part of a natural ridge, and that the earth from the space between them had been removed and added to the northwestern extremity of the ridge to complete the first mound, leaving the remaining portion of the ridge with the appearance of an artificial structure—an opinion with which I do not coincide. Measuring 90 feet from the eastern base of the second mound, in a southeast direction, we came to the base of the third. This mound was irregularly oval in outline, being 30 feet long from north to south, 25 wide, and 2 feet 3 inches high. Growing on top was a white-oak tree 2 feet 3 inches in diameter, 3 feet from the ground. Trees of various sizes, but smaller than this, were growing upon the mounds already described. Southeast from this third mound we came to a fourth. From an omission in my notes, I am unable to give the distance. It may have been anywhere from 20 to 100 feet. On account of the same omission, I am unable to draw a plan of the group. The mound was small, and flat. Twenty feet southwest of it was another small, flat mound, and 180 feet northeast of No. 2 was another of the same character. My recollection is that none of this group except No. 1 had ever been disturbed. It is a matter of regret that I did not have an opportunity to make internal explorations of the more important ones.

In the western part of what is now the village of Ovid there formerly existed a group of small burial mounds, marked on the map. They were long since destroyed by the cultivation of the land. I have an account of them from Mr. Dennis Birmingham, of Ovid Township, who is not unfamiliar with the works of the Mound Builders, and would not be likely to be deceived.

Continuing on down the Maple, in a northwesterly direction, something like a mile and a half, we come to the site of two small mounds, marked 2. The location is 30 or 40 rods west of the center of section 11. They are situated on a tract of rich, loamy soil, with a mixture of fine gravel, heavily timbered with several varieties of forest trees. The tract slopes gently down from higher land at the north till it blends with the Maple River bottom at the south. At the west it terminates in a bank or bluff about 12 feet high, 50 or 60 paces distant from the larger mound. At the foot of the bank is an ancient channel of the river, with low, wet bottom land beyond. It is not improbable that the river flowed through this channel at the time the country was occupied by the Mound Builders, though it is now found some distance farther southwest. The larger mound, measured by the eye, at the time of my visit was not more than 16 feet in diameter and 2 feet high. There was a shallow trench all around its base, from which, no doubt, a portion of the earth for its construction had been taken. Excavations had already been made in both mounds. In the vicinity of the mounds were a large number of "dug-holes." They were generally circular, some of them having a raised margin made by the earth thrown out, while around others the ground was level up to the very brim, as if the excavated earth had been carried away to aid in the construction of the mounds. Perhaps those with raised margins may have been made by the modern Indians for burying their corn. Possibly the Mound Builders also buried their corn in the same manner. It is not always easy to distinguish between the dug-holes of the Indians and those of the more ancient people.

Continuing down the valley of the Maple, in a direction almost due northwest, for a little more than 2 miles, we come to the site of the mound marked 3, on the northeast quarter of the northeast quarter section 4. This mound has disappeared in the process of cultivation. Mr. Gleason, the owner of the farm, describes it as 16 feet broad and 2 feet high. I remember that many years ago, when hunting there, while Mr. Gleason's farm was still a forest, the deer I was tracking walked over this mound, and I stood for some time on its summit, peering into the surrounding forest for signs of the game. My attention had not at that time been called to the works of the Mound Builders, and I did not recognize the real character of the curious little hill I stood upon. My recollection of it is that Mr. Gleason's estimate of its diameter is correct, but that it was fully 3 feet high. Mr. Gleason and others dug into it and took out a skull. They saw a large quantity of bones.

Going again to the northwest, at the distance of something more than half a mile, we come to an interesting group of mounds, marked 4, on the east part of the east half of the southwest quarter section 33, in Duplain. Leaving out of the account several small, slight elevations about the character of which there was doubt, this group consisted of four well-defined mounds. The largest one was oblong in shape, being 25 feet long, 20 feet wide, and 2½ or 3 feet high. Lying south of this, their bases almost touching, was another oblong mound, 2½ feet high, 22 feet long from east to west, and 14 wide. Southwest from the principal mound, distant 20 feet, was the third one, 3 feet high, 25 feet long from north to south, and 15 feet wide. All around these three the earth appeared to have been scooped out for the purpose of building them. The fourth mound of the group stood apart from the others, about 16 rods distant, in a southwesterly direction. It had been opened, and it was said that bones had been taken out. It was circular, 20 feet broad at the base and 3 feet high.

In 1877 and 1878 I made thorough examinations of the three mounds situated near together. The largest one was nearly all dug away, and a broad trench, reaching down below the natural surface of the ground, was carried through each of the others in its long diameter. In all three, with the exception of a surface layer a foot thick, the soil, a gravelly loam, was extremely hard and apparently impervious to water. It was the opinion of Mr. Trask, as well as of myself, that it had been rammed hard around and above the bodies. Forming an impenetrable protection to the bones, it has, in a great degree, preserved them from decay. In two or three cases the periosteum was found still adhering to its bone.

In the large mound were found six skeletons, besides some scattering fragments. Each of two lay alone; the other four were in pairs. In the case of one of those buried singly, as nearly as could be determined, the body had been laid on the back, the head to the east, the legs flexed under the thighs so that the heels were near the pelvis, and the head raised in such a position that, as the bones settled together in the process of decay, it rested on the left shoulder-blade. It has occurred to me since that it may have been buried in a partly sitting posture. The other skeleton that lay alone had been carefully disposed for burial. It had been placed in a shallow, short grave (before the mound was built), with the face to the north, the head to the east, the legs and thighs flexed as much as possible, with the head a little elevated. One pair had evidently been as carefully placed, with the thighs and legs flexed in the same manner, with the heads to the east, one looking north and the other south. The bones were in such close proximity that the backs of the heads and bodies must have touched. The order and regularity of this burial produced the conviction that the two bodies were buried at the same time. The position of the other pair could not be satisfactorily made out, but one skull lay above the other. All these graves were at or just below the natural surface of the ground.

In the mound lying south of the one just spoken of three skeletons were found. The first lay in the western half of the mound, a little below the natural surface of the ground. It had been placed on the back, with the head to the east and slightly elevated, the thighs and legs somewhat flexed, and the right arm flexed so as to bring the palm of the hand upon the upper part of the right side of the chest. Above the left shoulder lay a heavy stone ornament, charm, or token, of a blue color when first exhumed, but turning black on exposure to the air. It was 4½ inches long, 2¼ wide, and seven-sixteenths thick, slightly bent, and shaped a little like a hoe or an adz. There is a hole through the narrower end, by which it may have been suspended by a string from the neck. It appears to have been made from a stone that required but little fashioning to bring it to the required shape, as it showed but little polishing, and in spots the rough, natural surface could still be seen.

This was the only manufactured article found in any of the mounds examined by me in this part of the State. The second skeleton we came upon was in the upper portion of the eastern half of the mound, the skull, which was the most elevated part, being not more than 8 or 10 inches below the surface. It lay upon the back, the head to the east, the shoulders elevated and the head tipped forward upon the chest, the pelvis a little elevated, and the thighs and legs completely flexed. There was a cut through the skull. Mr. Trask was of the opinion that it had been made before burial, and was the cause of death. I think it was accidentally made by the spade in excavating. The third skeleton was found at a lower level than the second, but not directly under it, a little nearer the north side of the mound. Like many of those found in the same group of mounds, it lay with the head to the east, on the right side, the head a little elevated, with the knees drawn up to the chest and the heels to the pelvis. A peculiarity in this burial is that the hands were placed in contact with the face.

Not the least interesting and instructive of the mounds of this group was the one situated a short distance southwest of the principal one. A little north of the center, a foot and a half below the surface, I came upon what, for want of a better name, I call an ancient fire-place. It was simply a level surface, made upon the mound when only partly built. I uncovered it with the greatest care, working for hours upon my knees, scraping away the superincumbent earth with a common table knife, so as not to displace anything that might be of interest. When done, I had before me a bed of ashes, mixed with charcoal and burnt sand, on which lay the bones of a partially burned human skeleton. At the bottom of the mound, just below the natural surface of the ground, were the remains of two skeletons, one under the north half of the mound, the other under the south. Both appeared to have been carefully disposed for burial, according to what seems to have been an approved mode—on the right side, the head to the east and slightly elevated, with the thighs and legs flexed so as to bring the heels near the pelvis. The following facts in the history of this mound are palpable: Two bodies were laid in shallow graves and a mound partly built above them; on a level spot on the partially built mound a fire was kindled and a human body burned; then the bed of ashes and the remains of the burned body were covered up with earth by the completion of the mound.

Continuing on down the valley, but bearing more towards the west, we come to what was probably the largest mound in this part of the country, situated on the northwest quarter of the southeast quarter section 32, on the farm of Edward Paine. It is marked 5 on the map. When my attention was first called to it, not only had excavations been made in it and the bones of several skeletons found, but more than half the earth of which it had been composed had been carted away for use elsewhere and the remainder was in process of removal. In order to improve what little opportunity for investigation remained, I volunteered to wield the spade during the completion of the work. Before this mound had been disturbed it was nearly circular in form, being 40 feet broad from east to west and a little less from north to south. According to the best information I can get, and I think it reliable, it was 4½ or 5 feet high. At one time three skulls and a quantity of bones were taken out. Mr. Paine says the skulls were found close together in the north part of the mound, and, though no special care was taken to observe the position, he thinks the three skeletons lay in a horizontal position, with the heads to the north. During the removal of the last portion of the mound, at which I assisted, nothing of interest was found except a fire-place. This was situated some distance below the surface, in the southwest part. The remains consisted of charcoal and burnt earth mixed with a considerable proportion of a sooty substance having the appearance of lamp-black. A careful examination of the charcoal, which was in small pieces and very soft, convinced us that the fuel had been largely pine wood. The fire had been kept burning for some time in a hollow or pit in what was then the unfinished mound. It had afterwards been covered up by additions made to the mound. No burnt bones or remains of artificial objects were found. Mr. Paine informs me that at a little distance southwest of this large mound were formerly several small ones, all of which have long since disappeared under the operations of the farm.

About 100 rods distant from the mound, on Mr. Paine's farm, in a direction a little west of north, on the same section, there was formerly a mound of considerable size. It is marked 6 on the map. It had been worked down with the plow, when I saw it, till only a slight elevation remained visible. It was said to have been 25 feet broad at the base and 4 feet high. I made extensive excavations on its cite, but found nothing. Mr. N. W. Brass, who was brought up from childhood in the vicinity, informs me that there was once a small one near it.

Let us now return to group No. 4, on section 33. Going from that point a little more than half a mile in a northeasterly direction, we arrive at the location marked 7, on the northeast quarter of the southeast quarter of the same section, on the farm of Charles Dailey. Here were formerly a great number of small mounds, scattered over a considerable area. That they were burial mounds, and not natural undulations of the surface, was proved by digging into them. All of them have disappeared.

Something more than a mile farther to the northeast, on the farm of H. B. Smith, on the southeast quarter of section 27, we come to the site of another mound, marked 8, all traces of which have disappeared. My wife, who was among the early settlers, remembered it well, and confirmed the accounts of it received from others. Mr. Smith represented it as 30 feet or more in diameter and 4 feet high. A small excavation was once made in it and a skull taken out. When I visited the place two thrifty peach trees were growing where the mound formerly stood.

I forgot to mention, in connection with group No. 4, that there are several dug-holes a short distance from the mounds. They are all perfectly circular and perfectly bowl-shaped. I carefully cleaned out one of them, examining every spadeful of earth thrown out, but found no relics. When cleaned out to its original size, as nearly as I could judge, it was 7 feet in diameter and 3 feet deep. There is no raised margin about any of them.

The only mounds in the township of Greenbush of which I have any knowledge are situated on section 11. One, marked 9, which I visited in July, 1878, was about 20 rods north and the same distance east of the center of the northwest quarter of the section, on the farm of P. Jefferys. It was in a grove of heavy oak timber, in a tract of country considerably broken by low hills. Its form was circular. I did not measure it, but judged that it was 35 feet in diameter and 4 feet high. Mr. Jefferys informed me that, before it had been disturbed, there was a perfectly level area 12 or 15 feet in diameter on the top. It was, in fact, according to his description, a regular truncated cone. Somebody had made a large excavation down into the center. It was reported that nothing was found. Another mound, said to be broader and flatter than the one above described, was reported to be situated 40 or 50 rods southwest of it. I spent considerable time in searching for it, but the forest being filled with an undergrowth of shrubs and small trees, almost impenetrable, I was not successful. Of its existence, however, there is no doubt.

In regard to the mounds in Essex, I cannot do better than to copy *verbatim* my notes taken during a visit to that township in July, 1878.

The tract of country occupying the central portion of Essex seems to have been a favorite place of residence of both the Mound Builders and the red Indians, as it is now of the whites. In point of fertility, ease of cultivation, and large returns for agricultural labor, it is seldom excelled. When first known to the oldest of the present residents it was covered with patches of thrifty hazel bushes, alternating with patches of a rank and nutritious grass. Oak trees of considerable size were scattered over its surface.

About 118 rods west of the northeast corner of section 16, and perhaps 25 rods south of the section line, the remains of a mound (10) are still to be seen. The field in which it is situated has been under cultivation for, perhaps, thirty years, and the repeated use of the plow has reduced the height of the mound as least one-half. The same agency may have also increased its apparent area and somewhat changed the form of its surface. At the present time the length of the base is 50 feet; width of the base, 35 feet; height from the natural surface of the ground, 2 feet; height from the bottom of the broad and shallow trenches around it, from which the earth was apparently taken for its construction, 3 feet. The long axis lies nearly east and west, but inclines a little (perhaps 5 or 6 degrees) to the southeast and northwest. The east end is bold and well defined; the west not well defined, the mound sloping gradually from the junction of its eastern and middle thirds to the natural surface of the ground at its west end. The earth for its construction appears to have been scooped up around its base, but principally in three places—around the east end and along both sides of the western part. At about the junction of the eastern and middle thirds, corresponding to the highest part of the mound, the earth appears to have been left in place on each side, forming a passage between the excavations to the foot of the mound, and, perhaps by artificial additions made to it, a graded way to the top. The soil is a sandy loam, with a small admixture of gravel. I worked with a spade for three days in succession, and made extensive excavations in it, but without finding relics or any evidence of the use it had been put to. A short distance easterly from this mound is a smaller one, situated directly in the line of the axis of the larger, which has nearly disappeared under the plow.

. On the south part of the northeast quarter of the northeast quarter section 16 is another mound (11,) but a little less in size than the of preceding. Its form is circular. According to measurements that I made, its diameter at the base, at the present time, is 40 feet, and the height above the natural surface of the ground 22 inches. There is a broad and shallow excavation all around it, from which the earth for its construction was taken. Its height has been diminished by the plow at least one-half. Mr. James Soule was familiar with it before the land was improved. He says there was an oak tree growing upon it, which, when cut, many years ago, measured 32 inches in diameter at the stump. At a short distance east-northeast of this mound is plainly to be seen the remains of a smaller one.

On the northwest quarter of the northwest quarter of section 23 are two mounds (12) of no great size. They are near together, one west of the other, on a ridge running east and west. They are plainly seen, but are fast disappearing under the plow.

There are two small mounds (13), near together, about 85 rods north and 33 west of the center of section 23, on the farm of Jonathan Hicks. Like those just mentioned, they are still plainly visible, but are being rapidly graded down in the process of cultivation.

There was formerly a remarkable group of very small mounds (14) on the section line between sections 15 and 16 commencing about 40 rods north of the southeast corner of sixteen and extending about 40 rods farther north. Mr. Soule says there were as many as forty of them. They were raised but a little above the surface of the ground, and are represented as having been full of human bones. A gentleman whose name I have forgotten, but whom I regarded as reliable, told me that he had frequently passed over them before they had been disturbed, that the bones in many instances were sticking up out of the soil, and that he had pried out with a stick skulls that were so protruding. These mounds, with perhaps a single exception, have all been graded down and destroyed in the construction of the highway and the cultivation of the adjoining fields.

The opinion of the people living in the neighborhood, founded on Indian tradition, is that the Essex mounds, large and small, were the graves of the dead killed in a battle between the Chippewas and Potatwatomies which occurred not many generations ago. Mr. Soule called the attention of a very aged Indian woman to the mounds and asked her their orgin. She confirmed the tradition of the battle, and affirmed that she had the account from her grandfather, who was an actor in the affair. There are many reasons for doubting the truth of the tradition as far as the larger mounds are concerned, but the group of forty small ones may possibly have been the graves of the victims of the battle alluded to. More than this cannot be conceded. The larger mounds were undoubtedly the work of the race of Mound Builders, and were in existence long before the traditional battle was fought.

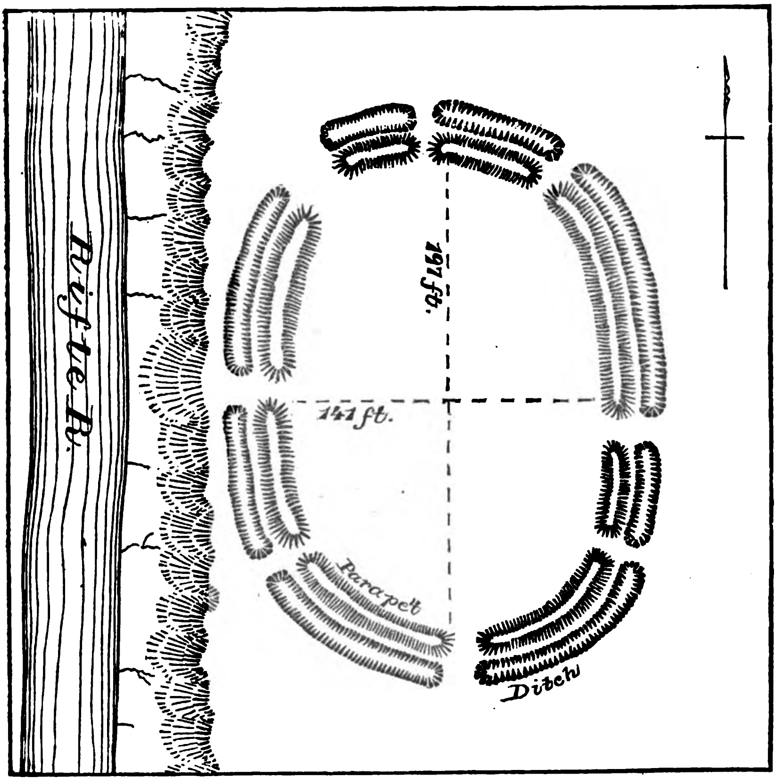
Two or three miles southwest of group 13 I saw several interesting dug-holes, but find nothing in my notes in regard to them, and cannot now give anything like a full description from memory. The exact location I have forgotten.

ANCIENT FORTS IN OGEMAW COUNTY, MICHIGAN.

By M. L. LEACH, *of Traverse City, Mich.*

June 18 and 19, 1878, I examined two old forts on Rifle River, in the township of Churchill, Ogemaw County, supposed to be the work of the Mound Builders. The following is a transcript of my notes made at the time:

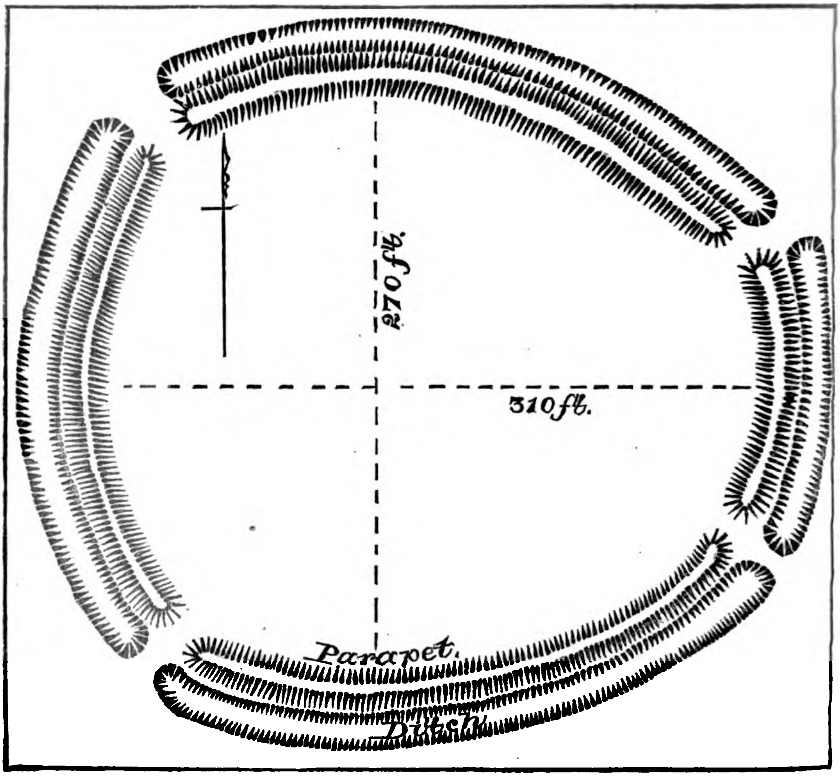
No. 1, the smaller of the two, is situated on the northeast quarter of section 4, township 22 north, of range 3 east, on the east bank of the river, on a bluff elevated 25 feet above the water. Its form is irregularly oval, the long diameter, from north to south, measured from center to center of the parapet, being 197 feet, and the short, from east to west, 141. The southern portion is a trifle wider than the northern. The work consists simply of a wall of earth, with a ditch on the outside. The ditch at the present time is from 2 to 3 feet deep and from 6 to 10 wide; the wall from 2 to 3 feet high and from 6 to 10 wide at the base. There are eight openings in the wall, distributed at irregu-



Fort No. 1, Ogemaw County, Michigan.

lar intervals, but looking towards the eight principal points of compass. The one at the northwestern curve, just on the brow of the bluff, is the widest, and may have been the principal entrance. From it the hill-side seems to have been graded down, forming a gradual and easy descent to the river. Springs of excellent water come out of the face of the bluff near the bottom all along the front of the fort. There has been a heavy growth of pine in and around the fort. A pine stump standing on the wall measures 3 feet in diameter, and the lumbermen have cut several of equal size within the area. The lumbermen have made a road, with a causeway of logs, along the springy hill-side, between the fort and the margin of the river, so that it is impossible to tell now exactly the form of the face of the bluff, but have not destroyed any portion of the earth-works. The river is about 50 feet wide, with low, wooded land on the opposite side.

No. 2, the larger fort, is about half a mile distant from the smaller, in a southeasterly direction. In form it is quite regularly egg-shaped, the larger end being towards the west. Its long diameter, from east to west, is 310 feet; its short, from north to south, 270. It is a heavier work than No 1, the ditch being broader and deeper and the wall of cor-



Fort No. 2, Ogemaw County, Michigan.

respondingly greater dimensions. In some places the height from the bottom of the ditch to the top of the wall is fully 8 feet. Unlike No. 1, this has only four gateways or entrances. These look northeast, northwest, southeast, and southwest, and being located with great regularity with reference to the peculiar shape of the fort, the two at the eastern or smaller end are much nearer together than the other two. The one looking southwest is much wider than the others, and was probably the main entrance. The ground within the inclosed area is quite uneven, rising in the southern part considerably higher than the parapet. As far as I know, but my search was not very extended, there is no water in the immediate vicinity. Pine trees equal in size to those mentioned in connection with the other fort have been cut on the walls of this, the stumps of which are still to be seen.

No mounds, graves or other remains, have been found in connection with these forts. Doubtless, when the country comes to be cultivated, flint arrow-heads and stone hatchets will make their appearance.

The measurements given above may not be minutely accurate, as I worked alone and without instruments, except such as I could improvise for the occasion in addition to a pocket compass. The general features of the works, however, as given, are substantially correct.

Residents of the vicinity asserted that there were mounds near the river, several miles below.

A SKETCH OF FLINT RIDGE, LICKING COUNTY, OHIO.

By Charles M. Smith, *of New Madison, Ohio.*

[afterwards Gerard Fowke]

The great numbers of flint implements, such as arrow, lance, and spear heads, drills, knives, scrapers, &c., which are found scattered through all parts of the country, frequently lead to inquiry as to the sources whence so great an amount of material may have been procured.

Under the general name of "flint," in this connection, are included various forms of siliceous stone, such as chalcedony, jasper, hornstone, chert, basanite, and even some forms of quartz that have no resemblance to flint.

The sources of supply are widespread; but before touching upon this part of the subject it will, perhaps, be well to give a short *résumé* of the different theories in regard to the manner in which is accumulated the material forming the beds, though geologists have not yet succeeded in settling this vexed question.

Quartz or silica, in its various forms, is one of the most abundant of the minerals forming the earth's crust. Hard (easily scratching glass), infusible, not affected by acids, it survives, unchanged, agencies that will destroy nearly all other rocks. But there is one way in which it can easily be reduced: the alkaline minerals, such as sodium, potassium, and a few others, form compounds which are highly soluble; when water, especially if thermal, thus charged, comes in contact with quartz, the rock is easily decomposed and held in solution until, by cooling or evaporation, the water will not retain so much foreign matter, and the silica is deposited. In this manner is the quartz supplied which forms our agates, geodes, crystals, the concretions around hot springs, &c.

Should the dissolved silica be carried onward, however, to a considerable body of water, it tends to produce flint or its allied forms in large masses; and there are different ways in which this can be brought about. In sea-water there exist microscopic animals whose shells are formed from silica in the same manner that the shells and skeletons of mollusks and corals are formed from carbonate of lime; and upon the death of these animals their remains find a resting place upon the bottom of the ocean, and hold a limited place in the rocks formed by the limestone-makers—limited because, although numerous, these animalculæ are so small that thousands or even millions of them will not equal in bulk a single clam-shell.

Generally the flint thus formed is scattered through the limestone in such a way as to be scarcely, if at all, noticeable; in the Niagara division of the Upper Silurian age it seems first to collect itself in nodules or masses by that mysterious proceeding called "concretionary action," a *something* which has never been explained. Even when the flint lies in a regular stratum, as it sometimes does, the layer is not continuous, but is broken up into these concretions. Similar masses are found in the succeeding geological formations, especially in the Chalk-measures; in fact, some geologists claim that the only true flint is that found in the Cretaceous rocks of Europe, and that flint proper is not found in America at all. Be that as it may, the term is now too firmly attached to our siliceous rocks of this nature ever to be changed. Flint formed thus, however, is found only distributed in other rocks and does not occur in masses to itself.

The principal *flint-beds* are found in the Carboniferous age, and the manner in which they are found associated with the other rocks of the series shows another of the methods of flint-making.

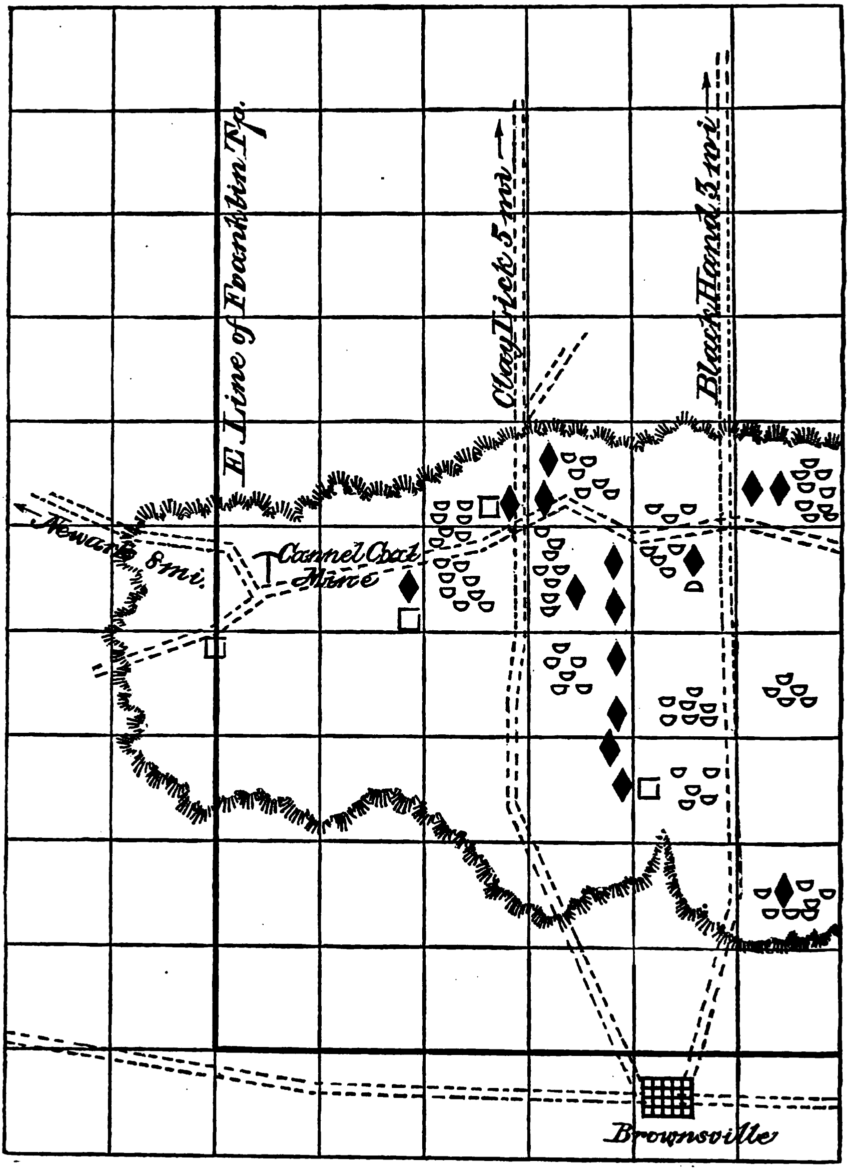
In the lagoons of the present day exist immense numbers of minute plants called Diatoms, which have the power of abstracting silica from the water and using it in their plant structure. On the decay of the plant the silica is not restored to the water, but is precipitated; and if this work is allowed to continue undisturbed, in time a thick deposit is the result. As a general thing, the slower the process the more compact the stone will be; and if no tides or freshets interfere, beds of pure siliceous rock inches or even feet in thickness may be formed. Geological conditions at the beginning of the Carboniferous age seem to have been favorable for the existence of these Diatoms in vast numbers, for in no other formation is the flint so abundant. Land-locked basins seem to have existed along the border of the ocean in that period, wherein our little plants flourished, while farther out the limestone was being formed by such animals as find their most suitable surroundings in open salt water; so that one has only to lay before him a section of a coal-shaft, suppose this shaft to have been made through rock of which some limestone layer was formed near the shore in quiet water, substitute "flint" for "limestone," and the explanation of flint-beds is at hand—such, at least, as are due to this vegetable agency. It is not to be inferred, however, that all flint should for this reason present the same appearance; there are to be taken into consideration the chances of occasional slight changes of level; tides and storms bringing in a supply of salter water, with, it may be, many lime-producers; the swelling of a tributary stream, where-by various organic and inorganic impurities are carried in to a greater extent, coming sometimes from one kind of soil, sometimes from another—all these points, and others, are to be remembered in accounting for the different grades and colors found even in a limited space.

These are the most common explanations. Recent investigations go to show that chemical changes at the bottom of the ocean have much todo with flint formation; and the process of substitution, whereby silica replaces other material in decaying substances, as is seen in the petrifaction of woody fiber, adds its mite to the limited knowledge of the subject; but the question is far from being definitely settled.

Throughout Eastern Ohio there are numerous deposits of flint of various descriptions; and in several counties places are to be found in which the "ancient arrow-maker" practiced his calling with the material so abundantly supplied.

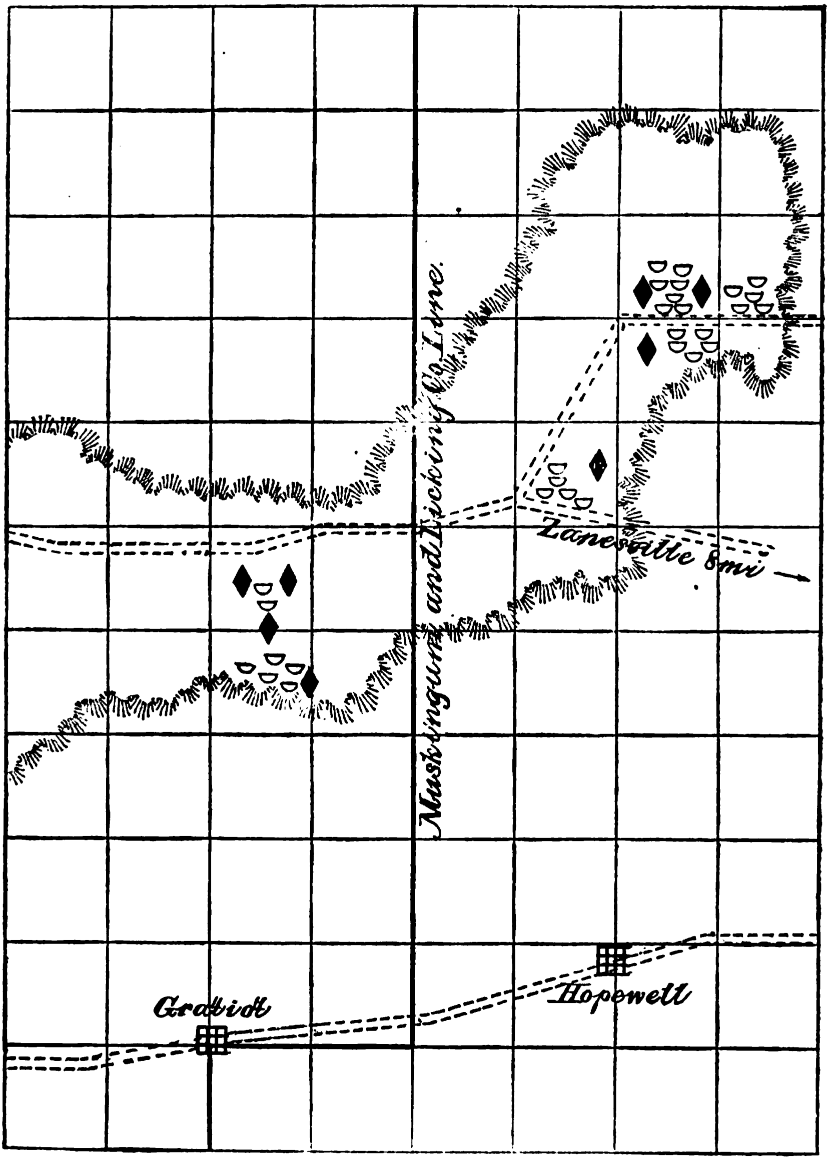
Pre-eminent among them, on account both of its great extent and the vast amount of aboriginal labor evident throughout nearly its whole extent, is the deposit lying in the southeastern part of Licking and western part of Muskingum Counties, Ohio. This has been known for many years as "Flint Ridge," and, numerous as are similar deposits in other places, it is by all odds entitled to be called *the* "Flint Ridge" not only of Ohio but of the whole country.

Its most western point is on the road leading from Newark to Zanesville, about 8 miles from the former place and half a mile from the eastern line of Franklin Township. From here it extends eastward across Hopewell Township and about 2 miles into Muskingum County, making its entire length very nearly 8 miles, counting by section lines, and fully 10 miles following the turns of the road. At about 2 miles from its western end, north of the village of Brownsville, it reaches its greatest breadth, 2½ miles. Owing to the extensive erosion that has taken place since its final emergence from the ocean (the summits of the hills being more than 300 feet above the streams), its outline is exceedingly irregular. The surface is undulating, but on the ridge proper is level enough to admit of a good road along its whole extent, while long spurs on either hand extend to north and south. Judging from the extent and direction of these spurs and the outlying ridges, the whole deposit was of an irregular crescent shape, with the convex side to the south and southeast. The road from Newark to Zanesville, called the "ridge"



Flint Ridge, Licking and Muskingum Counties, Ohio.

road, winds along close to the northern edge for about 6 miles, when it passes across the curve of the crescent, leaving it to the north.



• Flint Ridge, Licking and Muskingum Counties, Ohio.

The dip of the strata in this region, as in nearly all the eastern part of Ohio, being to the southeast, the flint at the western end of the ridge is very near the surface, while at the eastern end it is about 80 feet below the highest points, the country holding about the same elevation above the sea-level.

The flint, from its great resistance to weathering agencies, forms the cap-rock of the whole ridge, the superincumbent material being for the most part either clay or soil resulting from the disintegration of the shales and sandstones which formerly existed at this horizon. The natural place of the Kittanning coal of the Pennsylvania series is 15 to 20 feet above the level of the flint, but it runs out before reaching this far west—at least there is no trace of it here. Thin beds of bituminous coal lie at different levels in the hills; 104 feet below the flint is a workable seam of cannel-coal. A section of the formations in the eastern part of Licking County shows the same alternation of sandstone, shale, clay, coal, limestone, and iron ore that is found in all coal regions, so that a detailed statement of its geological structure is unnecessary in this connection.

Did the topography of the country depend upon surface drainage alone, the flint would act as a protection to the rocks below, and the whole ridge present a more symmetrical outline than it does; but, owing to the numerous crevices existing in it, and to the porous nature of the greater part of the underlying strata, water easily passes downward until it reaches the stratified beds of clay, along which it makes its way to the open air. The springs thus created have worn their way back, by the destruction of the adjacent rock and the consequent displacement of that farther away, until the whole region is a succession of steep hills separated by narrow ravines.

It is difficult to determine the thickness of the flint at any point without cutting through it, as the outcrop is so weathered and broken as to offer no safe basis for estimate. A few wells have been dug through it, and the thickness is given at different points at from 4 to 7 feet. It probably varies, owing to slight irregularities of the bottom on which it was deposited, and the more favorable conditions in some places than in others for the multiplication of the flint-making agents. It is thickest at the eastern end, according to persons living there.

In the fourth range of sections in Hopewell Township, counting from the western line, between the farms of Samuel McCracken and Lennox Fisher, is a break of three-fourths of a mile in which no flint is found, erosive agencies having removed all the rock for 20 to 40 feet below the level of the flint stratum. Beyond this it reappears, and continues unbroken to its eastern limit in Muskingum County.

In the geological scale this flint is continuous with the ferriferous limestone of Southeastern Ohio, and is highly fossiliferous in some places. In the museum of the State University is a very fine nautilus imbedded in a piece of buhr-stone from this place. Other smaller fossils occur abundantly both in this and the more solid flint, particularly *Fusulina cylindrica*, a small foraminifer found in great numbers in Europe at a corresponding horizon. Very frequently, however, the fossil, being calcareous in its nature, has disappeared, and only the matrix remains.

Underneath the flint lies the "Putnam Hill limestone" of the Ohio survey, so named from a high hill opposite Zanesville where it is well shown. The upper part of this limestone is shelly, sometimes closely approaching a thin sandstone in its appearance, and of a yellow cast; farther down it becomes more solid and takes on a blue color.

The flint varies in its nature in different parts of the ridge. It is impossible to gain an accurate knowledge of its appearance in many places without excavation; but, so far as can be judged from the outcrop and the reports of the well-diggers, the following will be found not far out of the way:

At the extreme western end the stone is of a gray or whitish color, cellular or porous in its structure, and of the sort commonly known as "buhr-stone."

By the oxidation of the included iron, it shows various shades of yellow or brown along the lines of fracture.

Half a mile east of this appears a translucent, bluish variety, fragments of which are seen scattered in the fields or along the outcrop. Still, the buhr-stone seems to predominate.

Two miles east, in the neighborhood of the cross-roads, the flint changes considerably. There is to be found every color and shade ever seen in such stone. White, red, black, brown, yellow, green, and blue, in various shades, occur plentifully in the pieces around the fields and where the flint shows in the hill-sides. This coloring is all due to the oxidation of the iron and organic impurities contained in the flint, as may be shown by digging to the bottom of one of the bowlders which shows different colors on its top; on reaching a part that is unweathered it is generally found to be of the same bluish tinge as the greater part of the bed-rock.

Near the intersection of the ridge road with the one leading from Brownsville to Clay Lick Station (on the Baltimore and Ohio Railroad), which, for distinction, is called the cross-road, the well-diggers report that the flint is light blue and translucent. A few hundred yards north it is nearly white, while at the same distance south a layer of a very dark shade is reported at the same level by parties who sunk a shaft here many years ago "to see what was down there." To determine what was meant by "dark flint" it was decided to clear out the trash that had blown into the shaft and examine the flint in its place; and this is the result:

Commencing at the edge of the shaft, the flint was found at 3 feet under the original surface, but as this was near the outcrop it is not to be taken as the full thickness of the overlying dirt, for there is a rise of several feet from this point to the top of the hill. Under this soil was a layer of flint of a grayish color, which must be very limited in extent, as no pieces of it are found in the "work-shops."

Next was the "dark flint," which is further mentioned on a following page. This flint contained a large amount of iron sulphide, which has oxidized along the seams, the iron giving a rusty-looking coat to the stone, which is not solid, as in some other places, but is in thin layers, between which a thin parting of clay is occasionally found.

The total thickness of the flint here was 29 inches. Next is a layer of bluish clay; on the top of this the sulphur set free by the decomposition of the sulphide had collected in a thin veneer.

The clay continues pure only for 2 or 3 inches; then sand appears mixed in with it; a little lower some lime also enters; next it is in thin plates; and finally, at 16 inches, it runs into the solid limestone. The clay is quite soft, but as the sand and lime become mixed with it the whole grows harder and more compact.

This same black flint is found east of here, beginning near the next section line and extending eastward for half a mile, and also at the extreme southeastern spur of the ridge.

A grayish, banded flint, presenting very narrow stripes of white or light gray, alternating with darker shades of the same color, is found a few hundred yards southeast of the cross-roads in rather limited quantity. On the farm of Joseph Duncan the same flint occurs in great abundance, the whole outcrop being of this nature on a point north of his house.

At the eastern end, along the Muskingum line, the flint has much the same appearance as at the western end—a buhr-stone that has been quarried to a considerable extent by the whites for making mill-stones. At the eastern termination of this stratum a white flint is found, having occasionally places in which iron has given it a reddish tinge.

It would seem, so far as can be judged from the limited opportunities for examination, that at the edges of the deposit, on every side, it is more in the nature of the buhr-stone, while through the central part, probably owing to clearer or less disturbed waters, the formation of a denser, purer siliceous rock was possible. Scattered around the pits, to be spoken of later, south of the blacksmith shop, at the cross-roads, near where the "shaft" mentioned above was sunk, can be found all the colors and shades mentioned, while farther away, in all directions, it seems to be of one general character. Much of it answers to the description of chalcedony, nearly all at the central points being translucent or even transparent. The so-called "black flint" is not the opaque variety, basanite, found in other parts of the Coal measures, but a clear, vitreous kind, containing a large amount of iron and carbonaceous matter, to which its color is due. This is proven by finding pieces almost perfectly transparent from the absence of impurities, and ranging from that to a deep black that is translucent only in the thinnest flakes. Some of it has the coloring matter so distributed as to resemble moss agate very closely; a variety occurs which has a beautifully mottled or clouded appearance, due probably to the entanglement of some gas in the silica at the time it was deposited, the cloudy part being sometimes in spots, again in narrow stripes, and occasionally in bands, which make it resemble small concretions. Agates cannot exceed in brilliancy or delicacy the beautiful markings found in many of the fragments.

In nearly all the crevices in the flint, so far as digging by searchers goes to show, are found quartz crystals. These are of more recent origin, being formed by the evaporation of waters of infiltration carrying silica in solution. They vary in size from those which are microscopic to those as large as a hen's egg. Some are limpid as pure water; others are charged with carbonaceous matter, and sometimes in such quantity as to make them almost black. They are all short, the terminating pyramidal point frequently being all there is to them Generally they are found adhering to the face of the rock, though sometimes they may be found in the soil filling the crevices. In the latter case it is probable that the flint holding them has weathered down and they have fallen off, as crystals formed free or unattached to a base generally terminate in a pyramid at each end, a shape not found here.

Baryte and calcite are found occasionally, filling cavities in the flint.

A few dollars' worth of gold was washed out of the sand in the bank of a little stream on the south side of the ridge a few years ago, and stories of various Indians and Californians who know the location in these hills of nearly all the metals of the globe can be heard from every man who lives within miles. No doubt minute quantities of various minerals can be found such as occur in all geological formations; but coal and clay will be about the only sources of wealth that can ever be made available beyond the agricultural productions of the country. The land is admirably suited to the growth of grass, and this, with the abundance of pure water in every ravine, must make stock-raising the most profitable occupation in which the people can engage.

Now, as to the evidences of prehistoric industry.

The blacksmith shop of John Loughman, at the cross-roads, 3 miles north of Brownsville, is a central point from which distance and direction can be estimated, and has the advantage of being well known to every one for miles, so that a person can easily take it for a starting place.

It is not until within half a mile of here, coming from the direction of Newark, that pits opened for the purpose of obtaining flint begin to appear. The western end of the ridge was for some reason left untouched; probably it can be explained when we come to speak of the evidences of settlements; at any rate, the rock could have been easily quarried, and seems as well adapted to purposes of manufacture as at other places.

The pits first appear on the north side of the ridge road, and extend in a northwest direction, along a spur of about one-fourth of a mile in length, nearly to its termination. A ravine heads, near the road, east of this spur, and the next pits are found on the eastern side of this ravine, on the farm of Alexander Miller, whose land extends to the cross-roads.

The flint lies nearer the surface here than on the south side of the road, which at this place is about 500 yards south of the northern limit of the flint; and this space, occupied by the farms of Loughman, Miller, and Feegan, has pits over nearly its whole extent. Southwest of the blacksmith shop, on the farms of Loughman and Vermillion, the pits extend nearly half a mile, mostly in uncleared ground, as the succession of holes and ridges where they have been dug makes it impossible to cultivate what little soil may be found among the rocks. The holes grow larger and deeper as the spur extends south, until at the end some occur which measure 60 feet across. Just how deep they may be cannot be told except by cleaning them out, as they are partly, or in some cases wholly, filled with dirt and decayed vegetation. They nearly always contain more or less water, the present summer being the first one in many years that they have been dry. Jumping or throwing a heavy stone in them causes the whole surface to tremble, showing that the muck filling them is still soft and spongy below, and the length of time this trembling continues indicates a considerable depth. South of Miller's house, and east of these just mentioned, are a few, but they are small, and the amount of débris around them shows their depth to be inconsiderable as compared with the larger ones.

Ten or twelve acres have been dug over on the western side of the cross-road; that is, if the actual area excavated be measured it will amount to that much, though the pits themselves are scattered over several farms. The spurs are narrow, and in many places there is a considerable interval between the points in which the work has been carried on; those lying on the southern spur, however, are close together, and very great labor has plainly been expended on them.

On the east side of the cross-road the holes increase in size and number.

North of the blacksmith shop are about 6 acres every rod of which has been dug over. Many of the pits here hold water the entire year. They are mostly shallow, as the soil is thinner here than at other points in the excavated district; some are filled with muck, while others contain very little trash. This field has been cleared and cultivation attempted in such parts as can be plowed, but without much success, as the amount of loose flint heats the ground to such an extent in summer that everything dries up.

East of these, in a piece of timber, are 2 acres of larger and deeper pits. Then, scattered at irregular intervals, are a few, single or in small groups, extending for about half a mile east of the shop, when there is a break in the work and no more are found on the north side of the road for nearly a mile.

South of the road, on the east side of the cross-road, continuous with those described as north of the shop, and extending for about 500 yards in a direction east of south, are the most extensive excavations, both as to size and number, to be found in an equal area anywhere in the State. The part dug over sometimes narrows to 5 or 6 rods, sometimes widens out to 300 yards. Some of the pits are small, from 15 to 20 feet across; others have a diameter of not less than 80 feet. As with them all, the depth is difficult to determine. A pole 18 feet in length has been thrust out of sight perpendicularly in one without encountering anything more solid than the muck and trash which shows at the surface; but this is scarcely a fair test of the depth, for should there be a crevice in the limestone beneath, as there well may be, for the stone has frequent joints, the slow drainage would gradually enlarge it, and the trash could thus sink to a greater depth. Besides, the ground is undulating from here to the cross-roads, and a rise of 10 or 12 feet would scarcely be noticed by any one in walking that distance along a winding path.

There can be no doubt that a greater thickness of soil lies over this particular place than over others. That the holes on this spur (which lies mostly on the land of J. G. Loughman) were much deeper originally than at any other point excavated is plain from the higher banks of dirt and broken rock piled around them. The spur is directly east of the one running south from Miller's, and the fragments lying scattered around on the two points show that the stone is of the same general character in both; in fact, the ravine between them, up which extends the cross-road, has been eroded from the middle of a local deposit that is of richer color, more compact texture, and better adapted to the needs of those using flint implements than is any other part of the whole ridge. It is at these places that the most beautifully colored pieces are found, and there is no doubt that if some of these deepest pits were cleaned out a more comprehensive idea could be gained of the original method of excavating, and a better assortment be secured than at any or all other places on the ridge, both as to color and variety.

Going still south and east from here, and crossing a deep depression drained both to the east and the west, we come to an isolated area, from which spurs extend to the north, east, and west. The first spur reached, that trending north, is on the farm of W. Iden. In a cleared field, about 1 mile from the cross-roads, are five or six large pits; a short distance east of these between 1 and 2 acres of small, shallow ones are found. In spite of their number, it does not appear that much flint has been taken from them. No others are found until the Bowman farm is reached, nearly a mile southeast from Iden's. Here is a spur extending east, on which are 2 acres of pits of a size to compare with those north of the blacksmith shop, that is, from 15 to 30 feet across. There are two spurs reaching from here—one toward the southwest, on which no pits exist; the other southeast, extending about a mile, and terminating on the farm of J. Kreager. Here is about an acre that has been dug over, and from the fragments scattered around it would seem that both black and white flint exist on this point. Before reaching Kreager's a spur goes off in a southern direction on Drumm's farm, but it was never worked.

No more flint exists in this direction. Directly north of the spur on Bowman's farm, and separated from it by a deep, narrow ravine, is a spur on the farm of E. H. Duncan, containing pits of the same character and about the same extent. Immediately east of these, in timber belonging to Joseph Duncan, are five or six large, deep excavations. Continuing north, we come to the depression spoken of as separating this area from the main ridge. Lying partly in this is the farm of Capt. John Loughman. North of his house about an acre has been pretty thoroughly dug over East of this in a bleared field, is about half an acre the flint from which is a dark variety, approaching more nearly to that at the "shaft" than at any other place on the ridge. This field is nearly a mile from the blacksmith shop and close to the town house, located at the point where the ridge road is crossed by the one leading from Black Hand Station to Brownsville. East of the town house is the farm of Samuel McCracken, on the northern and eastern parts of which are two small groups of pits, both comprising about an acre, on a spur extending northward.

Just beyond here commences the before-mentioned break in the stratum of about three-fourths of a mile, the flint next appearing on the farm of Lennox Fisher, about a mile west of the Muskingum County line. Some 300 yards east of his house are three large pits, which the owner calls "ponds," as they generally furnish water for his stock through the summer.

The bottom of these "ponds" is 5 or 6 feet below the surrounding surface; the original depth was at least twice or three times as great, if they preserve the same slope the exposed sides show.

The dip of the stratum is more apparent here than at the western end, as knolls 25 to 30 feet high are in the immediate neighborhood of the pits.

About one-fourth of a mile south of this, on the adjoining farm of William Fisher, a piece of woodland contains 2 acres of pits, some of which are 50 to 60 feet across, but seem to be of less depth than holes of a corresponding size near the cross-roads.

This is the last sight of aboriginal work on Flint Ridge within the limits of Licking county.

The pits being so scattered, and nearly all in dense timber, it is difficult to form an accurate estimate of their extent. Certainly they cannot occupy a smaller area than 60 acres, counting only the space actually excavated.

Half a mile east of the line of Licking and Muskingum Counties, on the farm of Mathias Drumm, are a few pits, one about 60 feet in diameter, the others much smaller; there are not more than a dozen of them.

No others occur until the farm of Jacob Burrier is reached, about 3 miles from Fisher's place. A few small pits exist in the woods southeast of his house. These are on the southern point of the eastern end of Flint Ridge.

About three-fourths of a mile east of Burrier's house, on the Brookover farm, are 2 acres of pits, on the most eastern point of the ridge. About the same extent of ground is dug over on the Varner farm, half a mile north of Burrier's house. Beyond Varner's the spur extends half a mile north, and here is the termination of the ridge in this direction.

To sum up, then, we find these pits reaching from half a mile west to a mile and a half east and from a fourth of a mile north to a little more than 2 miles south of the blacksmith shop at the cross-roads. These vary from 12 to 80 feet in diameter, and some of them, at least, cannot be less than 20 feet in depth.

Then, a small number, some 2 acres, 3 miles east of the shop and near the Muskingum County line.

Finally, a number scattered along in Muskingum County, from half a mile to nearly 2 miles from the line, those farther east being, as a general thing, smaller than the ones in the vicinity of the cross-roads.

They are found on the most northern, southern, and eastern spurs of the ridge, but not within 2 miles of the most western spur.

These distances are only approximate, the winding roads and perplexing sign-boards making it impossible for even those long resident in the locality to form any very correct idea of the distance between two places. It is easy to count up section lines, but when one attempts to follow the roads it will be found that a "mile" is an exceedingly indefinite unit of measure.

The flint around the edges of the whole deposit is not so diversified in color or quality as that in the more central parts, nor does it seem to have been so well adapted to the manufacture of the finer grades of implements.

The amount of work done in excavating is such as would require hundreds of men for many years, even with our superior advantages in the way of better tools, there being from 4 to 8 feet, and in a few places even more, of soil and loose rock to remove, and the flint being so hard that the best drill, according to the well-diggers, cannot penetrate it more than 6 inches without being repointed and retempered. When we take these facts into consideration, and remember that the aboriginal workers had nothing but stone tools, the magnitude of their labor becomes apparent.

The time that has elapsed since this work was done must remain unknown. Efforts have been made to estimate the length of time necessary for trash to accumulate to any particular thickness; but when we know that sometimes an inch and sometimes a foot of leaves may pile up in a single storm, this forms a very unsatisfactory basis of calculation, especially when it is not possible to know the amount of compression that takes place in any given time. "Results" thus obtained are no better than the merest guesses.

On the dirt thrown out from some of the pits are oak trees over 3 feet in diameter, that it is plain have sprung up since the pits were abandoned; stumps and trunks decaying on every hand point to trees still older. Timber will not increase in size nearly so fast on this stony ground as it will under more favorable conditions, so that centuries, possibly, have passed away since any work of this sort has been done here.

How these ancients knew where to find the best flint for their purposes, unless indeed these sites were chosen at random, cannot be told. It also remains a question as to how the flint was quarried after its location was determined. No doubt a thorough examination of some of these pits will throw much light upon the methods in use among them for obtaining the raw material.

In Coshocton County, near Warsaw, are some similar pits which have been opened by residents of the locality. In them were found two layers of flint, the upper a dark variety, the lower a clear, translucent kind, which answers to the description of chalcedony. This lower flint seems to have been the kind sought. Traces of fire were plainly visible in the pits, from which the inference is natural that fires were built upon the rock, and that, while heated, water was thrown on it. The stone could thus be broken into pieces. In the bottom of the pits were found bowlders of granite, syenite, and other glacial rock, which plainly showed that they had been used as hammers. No doubt a similar plan was followed at the ridge, and such a supposition is supported by the fact that these hammers, weighing sometimes 40 pounds, are found in the fields around the pits. Although the glacier did not cover any part of the ridge, the western line of Franklin Township coincides very closely with its limit; besides which the Licking River, which is not more than 3 miles distant in some parts, carries down glacial material in the ice every winter, so there would have been nothing difficult in finding abundant material for tools; in fact, the pebbles of which the smaller hammers could have been made are found several miles south and east of the glacier limits, even on high ground, having been carried there by floods or floating ice at the end of that period.

The hammers are found in greatest abundance wherever other signs exist of an ancient "work-shop," or place where the flint was dressed.

Of these work-shops there are two sorts, which are generally distinct, though sometimes the two sorts of work were carried on in one place.

One may be designated as the "blocking-out" shops, the other as the "finishing" shops.

At the first kind, which are always near the pits, it seems the flint blocks were brought to a size and shape convenient for dressing into such implements as were desired. In them are always found the largest hammers, though smaller ones are sometimes picked up as well. Scattered thickly over the ground are angular fragments of flint, such as would result from knocking off corners and projections from the large pieces taken out of the pits, and also from breaking them up into smaller pieces, it being unlikely that a block of such brittle material could be broken up without much waste resulting.

The pieces thus fitted for working were then mostly carried to the finishing shops, though, as above stated, the whole work seems to have been sometimes completed in one place.

These finishing shops are characterized by the smaller fragments, thin flakes, and broken or unfinished implements, very seldom found in the blocking-out shops. The hammers found in them are generally of small size, seldom exceeding 8 ounces in weight, and are of harder or smoother stone than those found in the other class of shops.

The blocking-out in some cases was done at the pits whence the raw material was obtained; but generally a convenient spot was chosen to which all the larger pieces from pits close around were carried, rough worked, and then taken to one of the finishing shops, which are less numerous than the others.

Although these shops are to be found at many places on the ridge, only the more important, those where the greatest amount of work was done, will be mentioned here, as a study of the places named will give a visitor as good an understanding of the method of work as would an inspection of scores of similar places. The relation of the work-shops to each other and to the pits will be readily perceived from an inspection of the map.

The blocking-out shops show material scattered over from 5 to 10 acres in extent; the others, though covering less ground, show a greater amount of work on an equal area.

Of the first sort, then, the principal are located as follows:

On the farm of John G. Loughman, lying along the south side of the ridge road and just south of the western limit of excavation.

Northeast of the blacksmith shop at the cross-roads. The work seems to have been done here as soon as the flint was quarried out, and the fragments are scattered among the pits. Along the side of the road and within a few feet of the shop is a large pile, many wagon-loads, of angular fragments.

Northwest of the pits on Bowman's farm, and again between this shop and Iden's farm, at which place the two kinds of work seem to have been carried on at the same time, or perhaps, better to say, where a portion of the material, after being blocked out, was finished up, while the greater part was carried elsewhere for the finishing touches.

On McCracken's farm, within the limits of the pits mentioned as being north and east of his house.

On the farm of Lennox Fisher, between the pits on his place and those on William Fisher's land, is another work-shop combining the two kinds of work.

At Drumm's, east of Fisher's. Here the flint was blocked out at the pits.

Finally, the last blocking-out place of importance is on Burrier's farm. The stone from the pits north, and those on the Brookover farm east, was carried to what now forms part of several fields, and worked up.

A great amount of work is indicated here by the large territory covered by the chips and the number of hammers of all sizes, from 2 or 3 ounces to 15 pounds, scattered on every hand.

In regard to the finishing shops, there is scarcely a farm, or even a field, in all this region where evidences cannot be found of the fact that weapons were finished up, or at least dressed to some extent. Partially finished or broken specimens, spalls, and flakes may be gathered almost anywhere; unfortunately, such are, now, about all that can be picked up. Collectors from various places have been here so often and in such numbers, and have paid boys such fancy prices for "flints," that the ground is kept pretty well searched over. Indeed, when the ground is plowed in the spring, boys hunting "flints" are almost as numerous as the blackbirds following the plow.

The locations of the more important ones will be given:

On the Burrier farm is a knoll of about 10 acres, south of his house, on which the flakes are scattered thickly. The finishing up of nearly all the flint quarried in Muskingum County (except that from the few pits on Drumm's place) seems to have been done here.

Some 30 rods east of the pits on the Drumm farm is a strip of high ground containing some flakes and spalls—not many, but still in as great quantity as the limited number of excavations would lead one to expect.

In addition to the shop named on Fisher's place as combining the two kinds of work, is one of small extent, on a knoll north of the three pits, and another west of this, in what is now an orchard, where considerable work has been done.

Just east of the town house is a small area where the flint from the pits in that vicinity seems to have been finished. Southwest of this a limited space on Capt. John Loughman's farm has flakes quite thickly spread.

On Iden's farm is a field of 10 acres where abundant chips and flakes show that on this spot the finishing touches were given to all the flint from his, Duncan's, and Bowman's farms.

At John G. Loughman's house is about 1 acre thickly covered with pieces of all the colors to be found in this region, while on the same farm ,some 40 rods west, on the point containing the large, deep pits, is the most interesting spot of all. Hundreds of implements, in all stages of finish, have been found here, and each fresh plowing seems to expose them in undiminished numbers. As deep as a plow can go these specimens are found, and in such numbers that the jingling noise made by them sounds as though one were plowing through a lot of castings. At the side of the field nearest the edge of the hill the spalls are said to have been piled up in a mound before cultivation scattered them, as though the "ancient arrow-maker" had either thrown the fragments on every side of him, and thus gradually elevated himself, or else had heaped all the flakes and unfinished or broken specimens into a single pile. Over an acre of this point has been plowed this year, and the remains of "primitive industry" cover all this area. How much more may be hidden under the soil formed by vegetable growth since the shop was abandoned is uncertain, but it seems reasonable to suppose that all the part in which no pits are found, some 4 acres, may have been left by the aborigines as a place in which the work might be completed. On the part that has been plowed there is about half an acre in which the flint amounts to four-fifths of the whole; that is, if all the soil could be put in one pile and the flint chips in another, this would be the proportion of each.

Nearly all this is in small flakes and spalls, chipped off in finishing. Very few angular blocks or fragments are found, and such as do occur are those which were carried from elsewhere, but on which, for some reason, the finishing process had not begun. This is the only workshop on the ridge where may be found the flint "coves" from which were flaked off long, thin splinters to be used as knives, perforators, lancets, and the like.*

On J. Kreager's farm is a shop just north of the pits and on the side of the hill. Both angular fragments and thin flakes may be found here, showing that the rough blocks were fully dressed out before being carried away.

Smaller shops may be found on J. S. Loughman's land, just at the western edge of the break in the stratum, and on Cook's land, a short distance southwest of Capt. John Loughman's.

The work of making these implements, then, seems to have been thus:

The aborigines (meaning thereby Indians, Mound Builders, or whatever other name may be assigned to the people who did this work) knew that by digging into the unweathered bed-rock a quality of flint could be obtained better suited to their purposes than that which could be procured along the outcrop. The dirt was cleared away, by being carried out in baskets or skins, until the flint was exposed. Cleaning out a space sufficient for working purposes, a fire was built on top of the rock, and when it was heated water was thrown on it. This would cause the rock to crumble, and on clearing out the fragments a fresh surface of flint would be exposed around the hole thus made in it, from which pieces could be broken off with the large bowlders found in the vicinity. A question presents itself here, "If this method was used, why did they not follow the flint stratum, once they had found it, throwing the dirt behind them, instead of opening so many fresh holes?" The only answer to be given is that they did not, except in a few instances, and that is all we know about it.

The pieces thus obtained, if not already small enough, could be again broken into smaller ones of a convenient size for handling, and taken to one of the blocking-out shops. Here they were broken into pieces of such size as would be best adapted for the form of weapon desired, the faulty pieces rejected, and perhaps the largest blocks chipped into a rough outline of its final form. Next, it was taken to the finishing shops, where the smaller hammers were brought into play to chip off as much as was possible by such means, after which the weapon, if intended to be completed here, was flaked off, by means of pressure exerted with a piece of bone or horn, until it reached an outline as regular and a finish as smooth as its maker desired or was able to give.

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* On digging in this shop, after the above was written, it was discovered that the layer of chips was not so thick as it was supposed to be; at any point in the field soil free from flint could be found at not more than 16 inches below the surface. Still, an immense amount of work has been done here.

The well-diggers say that the flint can be got out in solid pieces measuring 12 to 18 inches each way; that it has a smooth, oily look not found in those pieces exposed on the surface; and that it is much tougher and harder to break. This "toughness" is probably due to the moisture in the stone, as the statement has been made that flint when first got out of the ground can be flaked off with but little difficulty, while after even a short exposure it becomes brittle and is liable to break in any direction. Whether, when thus dry and brittle, it could be restored to its former state by immersion or burial is a question for experiment.

One of the old-timers who has been living here for nearly fifty years says that when he first came to the country the old-fashioned flint-lock muskets were in general use, and that the hunters were in the habit of collecting pieces of flint and soaking them in oil for some weeks before using them. This caused them to last much longer; a flint that would, by shattering, become useless in one day, could by this means be made to last for weeks. Is it not possible that the aboriginal workers had some such process by which they could render their work easier and more certain?

Careful investigation of these finishing shops gives rise to another belief, namely, that very few weapons, as compared with the great amount of flint used, were ever fully completed here. The great number of roughly finished specimens found here, when there seems to have been no reason for having discontinued work on them, and the great quantities of similarly shaped pieces from this locality occurring at places quite distant, show that the majority of the pieces worked here were brought nearly to the required shape and that it was left with the final owner to give each one such degree of fine finish and symmetry as suited him. There are many places remote from any flint deposit where flakes and spalls are found in abundance, showing that flint implements of some description had been dressed on the spot.

The immense amount of work done at Flint Ridge, and the widely separated points at which material from here has been found, may be explained in two ways:

First, that some particular tribe or race owned this region, and carried on for generations, or perhaps centuries, a regular traffic in such unfinished weapons. It is stated in many works upon our modern Indians that each tribe has a particular form of arrow-head or other weapon, so that one found at a distance from a settlement shows to an experienced observer just what tribe has been represented in the vicinity. As it is highly improbable that any one tribe could have utilized the great quanity of flint that has been taken even from this one locality, there can be little doubt that a regular trade was carried on with neighboring tribes, or even with those at a distance; and in this view it is likely that the separate blocks were brought to the smallest compass compatible with their ultimate use, in order that as little useless material as possible would have to be carried away. And the same holds good with the so-called "leaf-shaped arrow-heads," even those dressed as smoothly as we sometimes find them; in support of which the following is offered:

An examination of flint weapons shows that there are two general forms of the upper part or point—the straight sides, as in Fig. 1, or the curved sides as in Fig. 2. The angle of divergence of the sides may vary considerably, but this does not affect the subject.

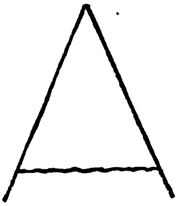


FIG. 1.

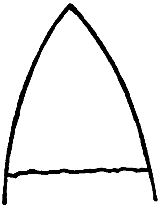


FIG. 2.

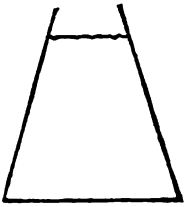


FIG. 3.

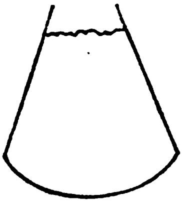


FIG. 4.

Now, in the many specimens which have been found in various factories, particularly the one under consideration, it may be noticed that nearly all which have been dressed as smooth and thin as they can be have two general forms of the base—the square, as in Fig. 3, or the curved or circular, as in Fig. 4.

Very few, comparatively, are found in which the barbs or tangs are finished out. Take almost any arrow-head, restore its outline by filling the chipped out places with wax (the experimenter will probably be surprised to see what a small quantity will be required), and the weapon will be restored to one of the forms made possible by a combination of the straight or curved sides with the straight or curved base.

A few such restorations are here given:

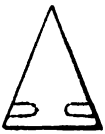


FIG. 5.

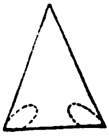


FIG. 6.

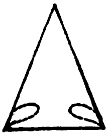


FIG. 7.

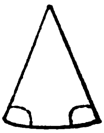


FIG. 8.

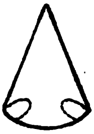


FIG. 9.

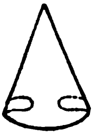


FIG. 10.

Similarly for those with curved sides.

These facts, which may be noticed at other places as well as at Flint Ridge, give much support to the theory of a general traffic in weapons by one tribe with other tribes, and goes far toward explaining the occurrence of the great numbers of unfinished weapons, flakes, and spalls of any particular flint scores or hundreds of miles from the place where it could have been quarried.

Before giving the second way in which the facts may be accounted for, a little digression is necessary.

As is well known to all who have perused the various works on archæology, Licking County is not surpassed by any equal area in the country in the size, number, and complicated arrangement of prehistoric earthworks. More stone mounds, too, are found in its limits than in any other one county, in Ohio at least.

From the immense works at Newark a system of mounds and other structures stretches towards the Muskingum Valley on the east and the Scioto on the west, so that by means of semaphoric communications the whole region could be appraised in a short time of any unusual event.

Notwithstanding this, the whole of Flint Ridge, despite its evidence of long occupancy, shows few remains of this nature.

The line dividing Franklin and Hopewell Townships crosses a stone fort. The hill-top is level and gradually widens out as it extends eastward from the fort, which incloses about 10 acres and is built upon the point of the hill in such a way as to reach the brow on the northern, western, and southern sides, and is admirably situated for defensive operations, and also for commanding the valleys leading from the ridge westward. Within it are two mounds, one of earth, the other of stone, not more than 20 yards apart. Both have been opened, but without results. The stone mound and the fort are constructed of flint blocks gathered up from the outcrop just below the top of the hill.

In the field containing the blocking-out shop, southwest of the blacksmith shop, is a circle of about 35 yards diameter; a few rods west of the blacksmith shop is, or rather was, another of about 50 yards; and on Bowman's farm, west of the pits, was another, whose size could not be learned. Both the latter have been plowed down level with the surrounding surface. They all seem to be village sites or permanent encampments, being on the highest ground in the vicinity.

On Captain Loughman's farm, in the finishing shop east of the house, a mound formerly stood which has been plowed down. From no point on the ridge can a more extended view be obtained than from the site of this mound. Hills in the three adjoining counties of Perry, Muskingum, and Coshocton are plainly visible, and the country nearer at hand is spread out like a map before the observer.

These are all the places, so far as known, that indicate any permanent settlements. Diligent search failed to reveal any traces of pottery or other domestic implements, nor does it appear that any relics have ever been discovered except such as may have been lost or abandoned by wandering, hunting, or exploring parties.

While on this part of the subject it may be stated that the "trail" from Grave Creek, West Virginia, to the lakes led past the captain's and close to the cross-roads. Old settlers speak of seeing the Indians follow it many years ago.

A so-called "furnace," which many of the inhabitants believe to have been used by the Indians to melt gold out of the flint (every man who comes to the country will be assured that this is "a solemn fact"), located half a mile south of the captain's, proves to be an old camp site. Being close to three large springs, it would naturally be selected by hunters and movers, and was much used, a large amount of burned sandstone being scattered around, of which fire-places were constructed.

A "mound" on the Muskingum line proved to be a spot where an excavation had been begun but soon abandoned; a crescent-shaped hole has the dirt from it thrown on the surface between the horns. Most probably made at an early day by whites seeking material for millstones.

To return to the argument: This scarcity of the evidences of permanent settlement on a scale commensurate with the amount of work done offers another solution of the unfinished state of so many implements, which is this:

It is well known that the celebrated "red pipe-stone quarries" were held as sacred and neutral ground by all the tribes which were accustomed to gather there for the purpose of procuring this rare and, to them, valuable stone. No matter what feuds may have existed between tribes, or what deadly enmities may have been held by individuals, when workers met in these quarries it was always in a state of peace, even if their differences would not allow friendly intercourse.

Some such feeling as this may have influenced the natives of this section of the country. With that disposition characteristic of the superstitious, nations as well as individuals, to attribute everything by which they are benefited to the direct and friendly interposition of a beneficent Superior Being, it is easy to believe that these people may have held this Flint Ridge as a sacred gift from their Great Spirit. All the different tribes may have resorted to this place to obtain material from which to fabricate weapons, and also, it may be, to secure the more brilliant stone for making totems or insignia, or for some tribal or religious ceremonies.

The stupendous works at Newark, and the connected system of mounds, &c., could have been built only by a nation that possessed the territory for a great length of time and were in large numbers. They would claim dominion over all the country round for many leagues, except perhaps this sacred ground, if so it was held, and would jealously guard their territory against the hunting parties from other regions; and although they would not, from religious motives, molest outside parties engaged in procuring flint, yet when these same parties went beyond their allotted boundaries, they would, like more modern people, find that a decided limit can be given to conscientious scruples by personal interests; hence it would behoove them to secure their flint as quickly as possible and get back to their own hunting grounds, unless, indeed, they had the means to supply themselves with provisions from the owners of the surrounding country, for supporting themselves, in case a longer sojourn was desirable. So that they would chip their flint to a portable size and shape, and carry it thus with them to such points as they chose, and there take all the time necessary for dressing and finishing it up.

The caches of so-called "disks," "scrapers," "leaf-shaped implements," "turtle-backs," or "hatchets," as they are variously named in so many localities where they are found, which may be regarded as nothing more or less than such unfinished pieces, render this theory plausible; and it certainly loses no strength if we accept the statement quoted some pages back that "fresh" flint is much more readily worked than "dry." Burying it in the ground would allow it to remain in working order much longer than if it were exposed to the atmosphere.

The finely dressed arrows or knives sometimes found, and the few "circles" in the vicinity, do not militate against the theory; in fact, they rather strengthen it; for such of the natives as lived within a short distance could well spare the time necessary to complete their work while they were about it, and the defensive position indicated by the fort and "circles" is only such a precaution as would naturally be taken by a settled people who were compelled to allow strangers or even enemies to remain so near them unmolested. Three hours' time, or even less, would have allowed a treacherous, hostile party to reach the Newark works from the Ridge, and it was only a matter of ordinary prudence to keep a look-out for such a contingency. The position of the fort, too, supports this view, being located, as it is, so far west of the nearest point to their settlements where any work was done, although a limit had been set past which none were allowed to go.

If it be objected to all this that it makes the Indian and the Mound Builder the same person, let it be remembered that no one has yet proven that the Indian was *not* a Mound Builder, or that the Mound Builder did not do this work on Flint Ridge.

Whether there is anything in these two "explanations" which possibly "do not explain," or whether a combination of both may better suit the case, or whether, finally, the facts must be explained by a new hypothesis, archæologists may determine. The writer, not professing to be posted in the science, simply submits such thoughts as will suggest themselves to any one who may go over the ground carefully; and if these observations will throw any light upon this interesting subject, or afford any information, let it be taken for what it is worth.

Strict accuracy is not claimed for the accompanying map. A person, without instruments or assistance, attempting to get area and distance on strange ground, much of which is covered with heavy timber and dense undergrowth, may be pardoned a few errors.

The roads and farms are taken from a county map; the pits, workshops, &c., are put as near as possible in their true positions, but are somewhat exaggerated in area, that they may be more easily located; and any one with this map will experience but little difficulty in finding anything of archæological interest on the Ridge.

Any one wishing to make a personal investigation will do well to begin his work by calling on Capt. John Loughman, living near the cross-roads. He has hunted over these hills for more than fifty years, and every field is familiar to him. He takes pleasure in giving information to the seeker of knowledge.

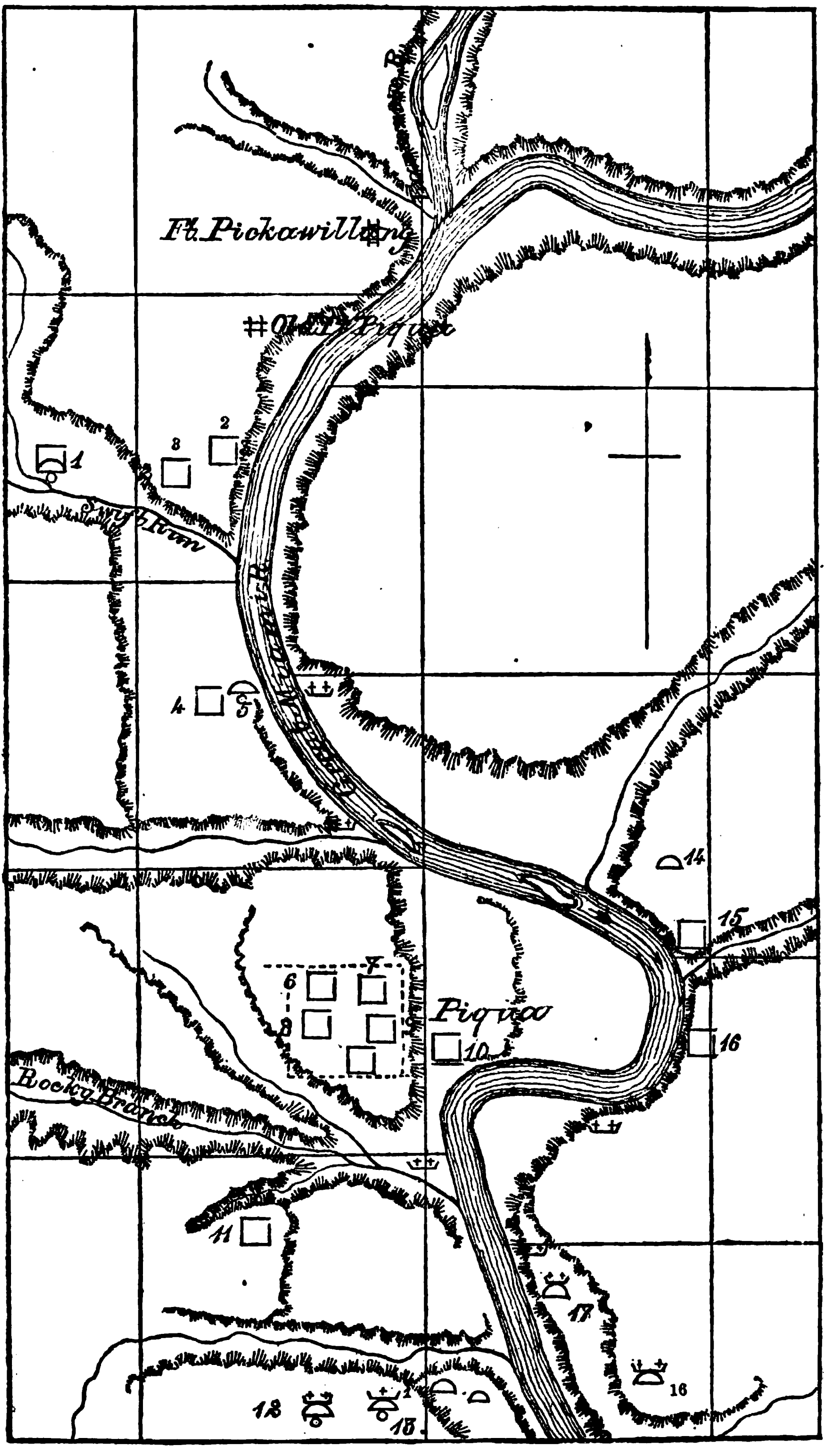
EARTHWORKS AND MOUNDS IN MIAMI COUNTY, OHIO.

By E. T. Wiltheiss, *of Piqua, Ohio.*

The accompanying map represents Washington and part of Spring Creek Township, Miami County, Ohio, in which are located all the ancient works that were in existence when the Europeans made their first appearance in that locality. The works are marked with figures to identify them in order.

No. 1 is a large ellipse whose axes are respectively 1,500 and 900 feet, and incloses, according to Col. John Johnston, who was the former owner of the place, 17 acres. The wall is made of bowlders, all water-washed, and, no doubt, they were gathered from the bed of the East Miami River. The work is located 3 miles north of Piqua, Ohio, and is 30 feet above the level of the valley of the river. The foundation of the wall is 10 feet wide at the base. The wall which was, at the appearance of the settlers in 1797, about 4 feet high, has fallen down, and the bowlders lie scattered all over the field. The present owner is destroying it as fast as possible, as he has the field under cultivation.

The figure of the ellipse deviates in some cases from a strict regularity to accommodate itself to the surface of the country as it then was. There was a large spring on the northeast in the fort which was walled with bowlders. About 30 feet southwest from the spring stands a bowlder on end 3 feet in height. On the south end of the fort is a mound 240 feet in circumference and 5 feet high. This mound was surrounded by a small ditch, which was paved with small bowlders. It took one man a week to remove this pavement. In May, 1880, the writer made an exploration of the center of the mound and found it to contain a sacrificial altar. After digging through a foot of soil, a stratum of yellow sand was encountered, 10 inches thick; then 6 inches of ashes mixed with burnt bones. This stratum of ashes was pressed in such a solid mass



Remains near Piqua, Miami County, Ohio.

that it required a pike to break through it. After the removal of the ashes, 19 inches of clay burnt red were met with. The excavation was about 6 feet square. There is a large stump of a tree standing a little to the north of the center of the mound. On the west side of the fort are three gateways 8 feet wide, which are covered on the outside by a stone wall 10 to 12 feet long, and 6 feet thick. There are also three small ravines running down to the valley below in front of these gateways, which no doubt were excavated by human hands. On the west wall are standing at present some very large trees.

No. 2 is a small circular fort situated 200 yards southeast of No. 1. The height of the wall is at present about 18 inches, but formerly, no doubt, it was much higher. This inclosure has a ditch on the inside, and gateways facing fort No. 1, and is about 150 feet in circumference.

No. 3 is a similar structure, and is located about 200 yards east of No. 2. This embankment has two gateways, one on the east and the other on the west, 8 feet wide. The wall is about 4 feet high and slopes towards the gateways. This also has a ditch on the inside. This work has never been disturbed. It is about 200 feet in circumference and is fenced and covered with sod.

No. 4 is located 1 mile south of No. 1 and situated on the second bottom. It is 300 feet in circumference, with an entrance on the southeast side, 10 feet wide. Its embankment is at present about 2 feet high and 8 feet wide, which the plow lowers every season, and its wall will soon be erased from the surface. This also has a ditch inside.

No. 5 is a mound situated 300 yards to the northeast of No. 4. This mound was 240 feet in circumference, and was formerly about 9 feet high, but at present is almost obliterated. An exploration was made by running a ditch from south to north to the center of the mound, and it was found to contain an altar composed of burnt clay. This was covered with ashes, charcoal, and burnt bones, 3 inches thick. On this was a layer of clay, then alternate layers of clay and charcoal 5 feet thick, each charcoal stratum being about 1 inch in thickness, the whole covered with clay and gravel mixed, 2 feet thick. West of the altar were found human remains, viz, a skeleton lying with the head towards the southeast imbedded in clay; the skull bore the appearance of having been crushed with a blunt instrument. Fragments of the skull were within the cavity near the surface. Broken pottery similar to that found in Kentucky occurred.

Nos. 6, 7, 8, 9, and 10 are altogether obliterated and were located within the present limits of the city of Piqua, Miami County, Ohio, all within an eighth of a mile of the river. These works were described by Maj. S. H. Long.

No. 11 is situated 1 mile southwest of the center of Piqua, on the upland. It is an ellipse 60 feet wide and 100 feet long, with ditch on inside and one gateway on the north. This work has been almost ob-

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PAPERS RELATING TO ANTHROPOLOGY.

OBSERVATIONS ON STONE-CHIPPING.*

By George Ercol Sellers, *of Bowlesville, Ill.*

When a boy, living among mechanics, artists, and artisans, preparing for the profession of civil and mechanical engineer, it was natural that I should be attracted to the studio with its adjoining workshop and taxidermic room of my mother's father, Charles Wilson Peale, and his sons. There was always something new to be learned there. He was a native of the province of Maryland, the son of one of the earliest Episcopal ministers who came from England and settled in that colony. He always took great interest in the history and incidents connected with the early settlement of Maryland and Virginia. He had a shelf in his library devoted to books and pamphlets relating thereto, many of which seemed to have been sent from Europe to him, for they bore inscriptions of "presented by," or "received from," my friend, Sir J. Banks or from Count Rumford, and others. Among them was a volume of autograph letters from his friend Thomas Jefferson on the same subject. This shelf was particularly attractive to me, for it always led to reminiscences of the most interesting character from my grandfather. On one occasion I came across on this library shelf a thin bound volume of letters of John Smith from the Virginia colony. It was a London publication, and (if my recollection is not at fault) comprised several pamphlets bound together. A passage in one of these letters, in describing an Indian he had met with, referred to the making of stone implements. I have not seen the publication since, and cannot after a lapse of more than sixty years quote from it, but will give the substance as impressed on my mind. He said in substance that the Indian carried with him a pouch filled with flakes of precious stones, and within his mantle, in a pocket made for the purpose, a small instrument made of bone or horn, that he *valued above all price* and would not part with, and with it he deftly shaped arrow-points and spear-heads from or out of the stone flakes. On calling my grandfather's attention to this, he said that although there was much truth in what at the time was written from the colonies, some things were highly colored and had to be sifted out or taken with caution, and he supposed the cutting of hard stone with bone or horn was one of these, and might be set down as one of Smith's yarns. I asked myself the question, What object could he have in inventing and telling it? There must be some foundation. At all events, it made an indelible impression on my mind.

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* In the summer of 1885 Mr. Sellers visited Washington and called upon Dr. Rau, to whom he gave an account of his experiences in stone-chipping, but dwelling chiefly on what he had heard from Mr. Catlin concerning this subject. Dr. Rau, perceiving the importance of Mr. Sellers's remarks, induced him to prepare the present article. It will be seen that the Indians of this country resorted in stone-chipping to methods similar to those employed by the Mexicans, as related by Torquemada and Motolinia.

Most of the arrow-points found within my reach in Philadelphia, Delaware, and Chester Counties, Pennsylvania, were chipped from massive quartz, from the opaque white to semi-transparent and occasionally transparent. Once, in company with my early preceptors, Jacob Pearce and Isaiah Lukens, both well-known scientists, on a mineralogical excursion, we came to a place where (judging from the quantities of flakes and chips) arrow-points had been made. After most diligent search only one perfect point was found, which is still in my possession, marked with ink "1818." There were many broken ones, showing the difficulty in working the material. Mr. Lukens collected a quantity of the best flakes to experiment with, and by the strokes of a light hammer roughed out one or two very rude imitations. No effort was made by pressure, which I cannot now understand, for at that time I was in the habit of breaking off points and trimming mineral specimens (likely to be injured by the jarring of a hammer stroke) by pressure with the hickory handle of my mineral hammer.

Maj. S. H. Long, afterwards colonel, who in the latter part of his life succeeded Col. John J. Abert as head of the Topographical Department of the United States Army, whenever in Philadelphia, was a frequent visitor at my father's house; and, when preparing for his expedition to the Rocky Mountains, in which my mother's youngest brother, Titian R. Peale, went as assistant naturalist, I saw him almost daily. The subject of flaking and forming arrow and spear-heads was one of frequent discussion. My grandfather, C. W. Peale, was at that time owner of the Philadelphia Museum, which had for that period a large collection of Indian curiosities, among them, many collected by Lewis and Clark on their northwestern expedition,—and to me the most interesting, was a box of stone implements in various stages of manufacture, evidently collected with the view of illustrating the process. They were never put on exhibition other than in the original package, the lid of the box only having been removed. Major Long's attention was called to these, and he expressed his belief that on his expedition he would learn the entire process, and on his return be able to explain everything in the Lewis and Clark collection.

The expedition returned, and, as far as I know, without any positive information as to the process of making the flakes. Mr. Peale said he had seen squaws chipping flakes into small arrow-points, holding the flake in their left hand, grasped between a piece of bent leather, and chipping off small flakes by pressure, using a small pointed bone in the right hand for that purpose. From this it was evident that John Smith's story was no myth. In my life-long intimacy with Colonel Long the subject of the flaking operation has frequently been one of conversation, on my regretting that more attention had not been paid to it on either of his expeditions. Knowing his pre-eminence as a civil engineer and his high attainments as a mechanic, I thought more reliable information would have been obtained by him and his party, composed as it was of such prominent men of science. He said that flakes prepared for points and other implements seemed to be an object of trade or commerce among the Indian tribes that he came in contact with; that there were but few places where chert or quartzite was found of sufficient hardness and close and even grain to flake well, and at those places there were men very expert at flaking. He had understood that it was mostly done by pressure, and rarely by blows, but he had never witnessed the operation. He expressed his belief that it was an art fast being lost, for he had found among tribes who had never seen a white man since the advent of Lewis and Clark, wrought-iron arrow-points made in England by the Birmingham nailers, sent out as articles of trade by the fur companies, and that they were preferred to the stone points.

My early acquaintance with Catlin, the artist, was in the shop of Catlin, musical instrument and model maker, of Philadelphia. There I knew him as a very expert and superior workman in wood and ivory. As a portrait painter he was not at that time successful. He painted strong likenesses, but they lacked life-like coloring. A delegation of Indians on their way to Washington gave him an opportunity to paint the likeness of one of the chiefs. This was exhibited in the Pennsylvania Academy of Fine Arts, and from its novelty attracted much attention; in fact, it was so far a success as to bring him into notice. About this time I met him very frequently; his conversation always drifted on to the great value and importance of preserving correct likenesses of the Indians, whom he believed to be fast passing away. We all know how well he lived up to this idea, devoting his life to the work of producing the collection of Indian portraits now in the National Museum.

On Mr. Catlin's return from his long sojourn among the Indians, believing that, as an observing practical mechanic, nothing in the way of art among them would escape him, I took the first opportunity to see him. On my inquiry as to the mode in practice of splitting the stone into flakes for arrow and spear points, his reply was by a question characteristic of the man. He asked if I had forgotten Dr. Jones's axiom, "The least possible *momentum* is greater than the greatest possible *pressure*." This was in allusion to a lecture on mechanics we had together heard delivered by Dr. Thomas P. Jones (afterwards Commissioner of Patents). He then added, "That is well understood by the flake makers among the Indians, but it will soon be among the lost arts, just as the nests of Birmingham brass battered-ware kettles, the Yankee tin-ware, and glass whisky bottles have already almost totally destroyed their crude art of pottery making. The rifle is taking the place of the bow and arrow. For boys' practice and for small game the iron points got from the fur traders are preferred to stone. A common jack-knife is worth to them more than all the flint knives and saws ever made."

After expressing himself in this manner he went on to explain what he had seen. He considered making flakes much more of an art than the shaping them into arrow or spear points, for a thorough knowledge of the nature of the stone to be flaked was essential, as a slight difference in its quality necessitated a totally different mode of treatment. The principal source of supply for what he termed home-made flakes was the coarse gravel bars of the rivers, where large pebbles are found; those most easily worked into flakes for small arrow-points were chalcedony, jasper, and agate. Most of the tribes had men who were expert at flaking, and who could decide at sight the best mode of working. Some of these pebbles would split into tolerably good flakes by quick and sharp blows striking on the same point; others would break by a cross fracture into two or more pieces; these were preferred, as good flakes could be split from their clean fractured surface by what Mr. Catlin called *impulsive pressure*, the tool used being a shaft or stick of between 2 and 3 inches diameter, varying in length from 30 inches to 4 feet, according to the manner of using them. These shafts were pointed with bone or buck-horn, inserted in the working end as represented in Fig. 1, bound with sinews, or rawhide thongs, to prevent splitting. For some kinds of work the bone or horn tips were scraped to a rather blunt point, others with a slightly rounded end of about one-half inch in diameter. He described various ways of holding the stone while the pressure was being applied. A water-worn pebble broken transversely was commonly held by being sufficiently imbedded in hard earth to prevent its slipping when held by the foot as the pressure was applied. Large blocks of obsidian or any easily flaked stones were held between the feet of the operator while sitting on the ground, the *impulsive pressure* being given to the tool grasped in both hands, a cross-piece on the upper end resting against his chest, the bone end against the stone in a slight indentation, previously prepared, to give the proper angle and to prevent slipping.

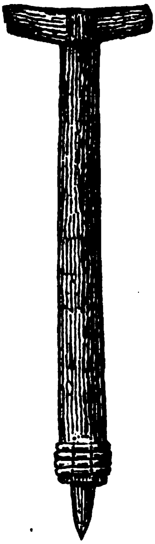


FIG. 1.

In some cases the stone operated on was secured between two pieces or strips of wood like the jaws of a vise, bound together by cords or thongs of rawhide; on these strips the operator would stand as he applied the pressure of his weight by impulse. The best flakes, outside of the home-made, were a subject of commerce, and came from certain localities where the chert of the best quality was quarried in sheets or blocks, as it occurs in almost continuous seams in the intercalated limestones of the Coal Measures. These seams are mostly cracked or broken into blocks, that show the nature of the cross fracture, which is taken advantage of by the operators, who seemed to have reduced the art of flaking to almost an absolute science, with division of labor; one set of men being expert in quarrying and selecting the stone, others in preparing the blocks for the flaker. This was done when the blocks were nearly right-angled at the corners, by striking off the corner where the flaking was to commence, and, with a properly directed blow with a hard pebble stone, knock off of the upper edge a small flake, making a seat for the point of the flaking tool. Sometimes these blows were carried entirely across the front upper edge of the block, making a groove entirely across the edge, when the first row of flakes have been thrown off. It is the work of this operator to prepare seats for a second row, and so on. What was meant by almost absolute science was a knowledge and skill that would give the proper direction to the pressure to throw off the kind of flake required. Fig. 2 represents, as nearly as I recollect, the rude sketches made of the flaking tool used to throw off massive flakes, when a sudden percussive pressure was required in addition to the impulsive pressure the man could give. The staffs of these flaking tools were selected from young hard-wood saplings of vigorous growth. A lower branch was utilized, as shown at *a* in Fig. 2, to form the crotch in which the blow was struck. Another branch on the opposite side, *a*, was used to secure a heavy stone to give weight and increase the pressure. When the stone to be flaked was firmly held, the point adjusted to give the pressure in the required direction, the staff firmly grasped, the upper end against the chest of the operator, he would throw his weight on it in successive thrusts, and if the flake did not fly off, a man standing opposite would simultaneously with the thrust give a sharp blow with a heavy club represented in cross-section *b* in Fig. 2, it being so shaped that its force is downward close in the crotch. It has been represented to me that a single blow rarely failed to throw off the flake, frequently the entire depth of the block of stone, sometimes as much as 10 or 12 inches. The tooth or tusk of the walrus was highly prized for tips of the flakers.

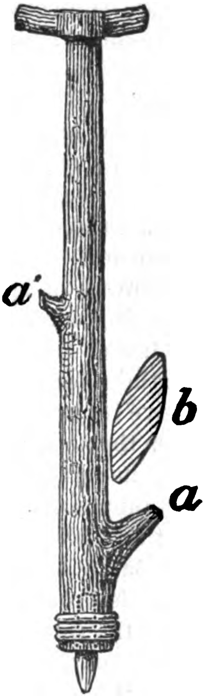


FIG. 2.

What I have thus far written is at second hand, being merely recollections of conversations at various times with the parties I have referred to, and more recently with a man who for over thirty years had been connected with a fur company, and who had lived most of that time among the Indians, and much of it, as a trapper.

What I now propose is to give some of my experimental practice in flaking and working flint (chert), and (from a purely mechanical standpoint) some conclusions drawn from a pretty extensive examination of the waste and refuse as well as finished and partly finished work left in the aboriginal flint workshops.

There are many places along the banks of the Ohio River and its tributaries that are not subject to the annual overflow, but are still below the occasional great floods, where the flaking process has been extensively carried on, and where cores and waste chips are abundant. At one of these places, on the Kentucky side of the river, I found a number of chert blocks, as when first brought from the quarry, from which no regular flakes had been split; some had a single corner broken off as a starting point. On the sharp, right-angled edge of several, I found the indentations left by small flakes, having been knocked off evidently by blows, as described by Catlin, as a preparation for seating the flaking tool. Most of the localities referred to are now under cultivation, but before being cleared of timber and subjected to the plow, no surface relics were found; but on the caving and wearing away of the river banks, as the light earth washed away, many spear and arrow-heads and other stone relics were left on shore. After the land had been cleared and the plow had loosened the soil, one of the great floods that occur at intervals of some fifteen or twenty years, would wash away the loose soil, leaving the great flint workshops exposed. It is from the stores of material left, the cores or nuclei thrown aside, caches of finished and unfinished implements and flakes, the tools and wastage, vast accumulations of splints, &c., that we can, on critical examination, draw tolerably correct ideas of the mode of working pursued.

One of these great flaking banks or workshops is exposed on the northern bank of the Saline River at its first rock "ripple," about 3 miles above its junction with the Ohio, the general course of the Saline being from the northwest to the southeast. Above the "ripple" the stream is only navigable during high water of the Ohio. On its southern side are ranges of hills from its mouth to its source, ranging between 300 feet and 400 feet in height, and on the divide between the west fork of the Saline and Eagle Creek they rise to a height of over 800 feet. The ridge is broken through by the valleys of small tributaries; the spurs from the ridge at places terminating in rock bluffs close to the river, at others leaving a narrow bottom. On the northern side of the stream the hills proper commence about 4 miles above the mouth, leaving a wider-valley or bottom on that side; the low bottom lands of the Ohio extend nearly to the ripple, where commences what is termed the second bottom lands of the Ohio, which rise rather abruptly, extending with the river by its windings at varying distance from it. It is on this ridge where it is intersected by the Saline that the coal company made the terminus of their railroad and shipping port of coal.

On my first visit, in the fall of 1853, this was in dense forests with the exception of a narrow strip along the bank of the Saline, which had been cleared for railroad coal dump, saw-mill, shops, and dwellings. The most of the cleared portion was a range of low sepulchral mounds crowded together. In cutting into them for foundations, small sized stone cists were exposed, none over 4 feet in length, with a single exception; this was (in excavating foundations for saw-mill boiler in the side of the largest of the mounds,) a skeleton at full length, surrounded by and covered with thin sandstone slabs, much as the small cists were formed. With this skeleton were found two small clay pots, some shell beads, a flint gun-lock, barrel, and metal trimmings of an old English musket, the stock so decayed that it fell to pieces when being taken out—no doubt a recent surface burial; in fact, human bones were found near the surface of all these mounds. The small cists over which they were originally raised contained nothing but fragments of bones, teeth, and occasionally a stone celt and a few flaked implements. The first indication of relics on what has proved to be a great stone implement manufactory was in sinking a cistern on the ridge about 200 yards from the river. This went through a mass of flint chips. By the year 1859 the little clearing around the house where the cistern was sunk had joined with the cleared strip on the river banks, making in all a clearing of some 25 acres. Heavy rains after the first plowing exposed some few specimens of spear and arrow points; the next plowing, a still greater number. But it was not until the great flood of the winter of 1862 and 1863 that overflowed this ridge some 3 or 4 feet, with a rapid current, that the portion under cultivation north of the mounds on the river bank was denuded, exposing over 6 acres of what at first appeared to be a mass of chips or stone rubbish; but amongst it were found many hammer stones, celts, grooved axes, cores, flakes, almost innumerable scrapers, and other implements, pieces of broken, much-decayed bone, but no perfect bone implements, many tines of the buck or stag, all of which bore evidence of having been scraped to a point. On exposure to the air they fell to pieces. Among this waste it was rare to find fragments of rude pottery, though they abound among the mounds near the river bank, and further north on the same ridge, where burnt sandstones, black earth full of fragments of shells and bone, show the site of a settlement—the field being nothing but a workshop. The great August flood of 1875, and the winter floods of 1881, 1882, and 1883 continued the work of denudation until the ground became unfit for cultivation, and was abandoned. The greatest number of cores, scattered flakes, finished and unfinished implements, are of the chert, from a depression in a ridge 3 miles to the south-east, where there is evidence of large quantities having been quarried. I have found a few cores of the white chert from Missouri, and the red and yellow jasper of Kentucky and Tennessee; but the flakes of these have mostly been found in nests or small caches, many of which have been exposed, and in every case the flakes they contained were more or less worked on their edges, whereas the flakes from the neighborhood chert preserved their sharp edges as when split from the mass. These cache specimens with their worked serrated edges would, if found singly, be classed as saws or cutting implements. But here, where found in mass, evidently brought from a distance, to a place where harder chert of a much better character for cutting implements abound, they tell a different story. No two are exactly alike, yet the work on all is of the same character, and evidently done for the same object. To one discovering that object, they tell the story clearly, as well as the mode of working, written on stone, and better than it can now be told either by writing or illustrations.

To make myself understood I must have recourse to sketches, and then will most probably fail to make it as clear to the general reader as these stone flakes do to me. Let us first look at a flake as detached from the mass, and study its nature, presuming it to have been flaked from a stone that by a hammer stroke would break with a fine-grain conchoidal fracture. Fig. 3 is a plan view of the outer or high side of an ordinary flake intended for a spear or arrow-head; the shape of this high side depending on the lines of fracture of the previous flaking. Fig. 4 is a section through the center of the flake on the dotted line *a a'*, showing its flat side and sharp edges. Fig. 5 an edge view, showing at its upper end the angle of the recess formed, and against which the point of the flaker had been pressed to throw off the flake; dotted lines in the cross-section Fig. 4 show the form of an arrow-head on the line *a a'* that the flake will work into. The form of the head is given by dotted lines in Fig. 3. From these it will be seen that the portion of the flake to be chipped away (and also the greatest portion of the chipping to be done) is from the flat side.

(Half size.)

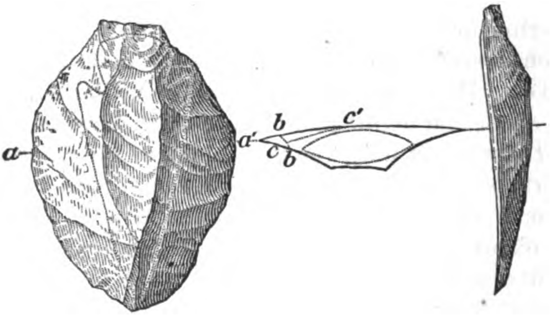


FIG. 3. FIG. 4. FIG. 5.

The man who makes the flake can at a glance see what it will best produce. His flakes are for transportation; bulk and weight are serious considerations. His practical eye tells him how to reduce them into the best merchantable form; and the greater number of the flakes found in the caches alluded to have been so worked, and always from the flat side of the flake. This could not be accidental. By referring to the axis line in section Fig. 4, the amount of chipping from the flat side that has to be done will be seen. To attempt to do this and to throw off long chips from the sharp edge of the flake would prove a failure, as its sharp edge would either crumble away or it would cut and injure the point of the bone flaker without throwing off the desired chip or flake. Experience has taught the operator the best shape of edge to apply the pressure to accomplish his object, and it has also taught him how to reach it in the simplest possible way. A spoon-shaped hollow on the top of a flattened log, or even a gutter or groove cut in it, furnishes the means of holding the flake firmly, the raised or high side placed in the hollow, the flat side up; with the ends of the fingers of his left hand pressed on it he holds it firmly, while with his right hand a downward pressure is given by the flaking tool which breaks off chips with a fracture of about 45 degrees from the flat surface, leaving the edge in the best possible shape for future work, and that is the condition of these cache flakes as they are found.

In old times, before the invention and introduction of planing and shaping machines to work metals, the first and most important lesson taught to the machinist's apprentice was the use of the hand-hammer and cold-chisel. When an outer shell was to be removed from a metal casting and its surface left in condition to be finished by file or scraper, the smoothness and regularity of that surface was essential, not only for economy in working, but accuracy of the file finish. The apprentice was taught to hold his cold-chisel and so direct the strokes of his hammer that when a chip was started the chisel should hold to it, and not be allowed to cut too deep or slip and fly out, leaving a shape that is difficult to start a fresh cut without leaving ridges or cutting deeper, in either case causing additional labor for the finisher.

To a practical mechanic the examination of such a flint workshop as I have described—its waste chips to the partly worked flakes, the roughed out blocks, and the finished implements—reveal a line of workmanship so clear that it can be followed to the production of the same results.

The handling of the tool and flake to form an arrow-point is as much an act requiring exactness and precision as the handling the cold-chisel and hammer is to the machinist. The first chip thrown off is analogous to the first starting work of the cold-chisel; it is the text that must be adhered to to the end of the chapter. Holding the flake in such position that commencing at what is intended for the point of the intended work, the pressure with the flaking point is brought to bear close to the edge of the 45 degrees angle and at right angles to it; the result is a flake thrown off inclining towards the stem end of the arrow-point. In sectional sketch Fig. 4 from *a* to *a′* shows the 45 degrees angle left by the first rough shaping from *c* to *c′* the direction of the first chip thrown off. The seat left by this chip when thrown off is concave on the edge of the flake, the advance corner of which is the seating point for the tool to throw off the next chip, which does not entirely obliterate the concave of the first, and the following chip leaves a serrated edge, the chips or flakes being generally parallel, which is the object of a good workman to make them. When the flat side by chipping has been reduced to nearly the required form, its edges are in the best possible shape for chipping the opposite or high side, then by alternate working from side to side the point is finished, either leaving it with serrated edges or by after delicate work throwing off the points, leaving a smooth, sharp edge. The indentations at the base either for barbs or for thongs to secure the point to its shaft are made by direct down pressure of a sharp point working alternately from side to side, the arrow-point being held firmly on its flat face. From the narrowness of the cuts in some of the specimens, and the thickness of the stone where they terminate, I have inclined to the belief that at the period they were made, the aborigines had something stronger than bone to operate with, as I have never been able to imitate some of their deep, heavy cuts with it; but I have succeeded by using a copper point, which possesses all the properties of the bone, in holding to its work without slipping and has the strength for direct thrust required. A soft iron or thoroughly annealed steel point answers even a better purpose. As yet no copper has been found on this flaking ground, though a few copper beads and remnants of what appear to have been ornaments have been taken from mounds on the ridges of the Saline, which I think is evidence that they had that metal at the earliest time work was done on this flaking bank.

Bryce Wright in his description of the Scandinavian knives or daggers refers to them as being most beautifully dentilled with parallel flaking and serrated edges. He says: "These knives or lances are true marvels of pre-bistoric art, and show an amount of skill and workmanship which cannot be imitated in the present age, the art of fashioning them having been entirely lost." Sir John Lubbock, on page 104 of "Prehistoric Times," says: "The crimping along the edge of the handle is very curious." As to parallel flakings with serrated edge, I have endeavored to show (from a mechanical stand-point) that the refuse of the great flint quarries points to a mode of working that must leave the dentilled markings parallel, and the edges worked from, serrated. What Lubbock speaks of as curious crimping on the edge of the handles is but the natural result of the mode of working I have examined these Scandinavian dagger handles, and find the same appearance on the blades of large-size broken piercers, numbers of which I have found among the rubbish, picked up, examined, and thrown away as imperfect specimens. Some of them have a spread, flat end or handle of over 1½ inch, with nearly square blades, evidently having been worked by down pressure from the edges corresponding to the spread end, these 45 degrees flakes meeting form angles and produce the square. The interlocking of the flakes at their meeting causes the crimped appearance, in some cases not unlike a row of beads, very beautiful, but not made with any such view, but simply the natural result of the mode of working.

Here also are found massive flakes or chips of fine-grained quartzite, that teach another lesson to a seeking practical mechanic, nosing about among the accumulated refuse. These flakes are often rough on one face, showing them to be an outside scale from the stone; occasionally, fragments of large flat implements that have been classed as agricultural (hoes or spades). These fragments have not been broken by want of skill in the workmen, but from undiscovered seams in the stone that did not show until the outer surface was thrown off. None of these fragments show any sign of use; in fact, some of them have not been wrought to an edge. I have several specimens of hoes from the same ridge beyond the settlement where it would naturally be cultivated, that from their highly polished working ends show long use. The lesson is that they are not made from great flakes, but rather represent the core from which flakes have been thrown off. Finished hoes and spades frequently have portions of natural stone partings that have not been worked off, and show them to have been worked from thin slabs. These slabs are a metamorphic thin bedded sandstone, belonging to what our State geologist, Prof. A. H. Worthen, calls the Chester group. They occur near the Saline, about 8 miles above the flaking ground, in an upheaval that has brought them to the surface with the upturned edges of the carboniferous limestone through which the salt springs flow. This is probably the source whence this quartzite was obtained, as slabs from 1 inch to 2 inches thick are found there; but there are many other locations stretching across Southern Illinois to the Mississippi River where they also occur.

It is the large agricultural implements that I refer to as having been made from quartzite slabs, some of which are as much as 16 inches long by 6 inches and 7 inches wide at the spade-blade end. There are many smaller specimens of the same form and character that have been regularly flaked from chert, white waxy quartz, yellow and brown jasper, that do not exceed 6 or 7 inches in length, their working ends highly polished by long use in digging. It is the large hoes and spades flaked from quartzite slabs that to me are evidence of a much higher degree of intelligence and skill than the most highly-finished spear and arrow points evince. Take an edge view of one of these large spades, and observe how accurately straight and free from wind the edge has been carried entirely around the implement, the flattening of one side and rounding the other; then observe that the long flat very slightly depressed flakes have been thrown off at right angles to the edge, even to those curving around its digging or cutting end, which appear to have radiated from a common center. If these flakes have been thrown off by blows so struck and directed as to preserve the cleanly lined edges, as the operator had carried them in his mind, a skill must have been acquired that we cannot approach.

In all the experiments that I have tried with a hammer, whether of stone, steel, soft iron, or copper, they have failed to produce the desired result; the seat of the flake is more conchoidal, shorter and deeper depressed, whereas the direct *percussive pressure* throws off the shape of flake that we find has been done in making these spades. If this mode has been resorted to, it necessarily required considerable ingenuity in devices for holding the stone slab firmly, while the pressure was being applied in the right direction. The wooden clamp described by Catlin may have been used. The simplest device that occurs to me that will answer the purpose is a block of wood planted in the ground, with its end grain up, cut on top into steps, as represented in sketch, Fig. 6, the lower step having grooves parallel with the rise of the upper step; in one of these grooves the edge of the implement is placed, its back resting against the edge of the higher step, as represented by the dotted lines showing the form of a spade. When in this position, presenting the proper angle to the operator, a man holds it firmly while another applies the pressure. A lower step, *e*, with the back edge of top are hollowed out to receive the work, while its lower end rests in an indentation in the lower step. In this manner a spade can be firmly held while its cutting end is being flaked. I do not present this as a mode that was practiced, but as a device that answers the purpose, and I judge to be within the capacity of the ancient flint-workers, of whom there is nothing left but their chips and finished work.

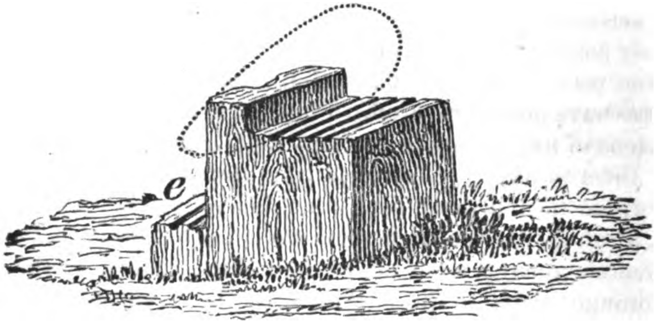


FIG. 6.

Let any one experiment with a bone point in chipping flint; he will soon discover the value of a *dry bone*, a bone free from grease that will hold to its work without slipping, a bone with sufficient hardness to resist abrasion, a bone of strength to bear the pressure, and he will value such a pointed bone, and will understand why, with such a bone, John Smith's ancient arrow-point maker "*valued his above price, and would not part with it.*" I have been informed that the modern Indians free their flaking-bones from grease by burying them in moistened clay and wood ashes, not unlike the common practice of our housewives to remove grease spots from their kitchen floors.

The hunter or trapper described to me a mode still in practice among the remote Indians of making flakes by lever pressure combined with percussion, that is more philosophical and a better mechanical arrangement than by the use of a flaking-staff, as described by Catlin. Figure 7 shows the manner of utilizing a standing tree with spreading roots

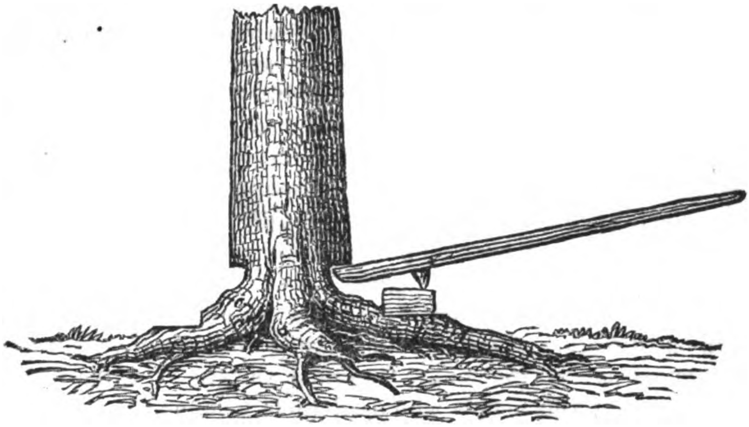


FIG. 7.

for this purpose; a flattened root makes a firm seat for the stone, a notch cut into the body of a tree the fulcrum for the lever; either a pointed stick is placed on the point of the stone where the flake is to be split from it, its upper end resting against the under side of the lever, or a bone or horn point let into and secured to the lever takes the place of this stick. When the pressure is brought to bear, by the weight of the operation, on the long end of the lever, a second man with a stone, mall, or heavy club strikes a blow on the upper side of the lever, directly over the pointed stick or horn-point, and the flake is thrown off.

Lubbock, in "Prehistoric Times," illustrated the Eskimo scraper as used at the present time in preparing skins. When we consider the close proximity of the flint workshop to the great salt licks on the Saline River, the flowing salt springs, the deeply worn buffalo paths still to be seen after having been subject to the destructive work of cultivation by the plow for more than a generation, where skins by the thousands must have been dressed, it is not surprising that the many chert flakes that have been split off with too great a curvature of their flat side in their length to admit of being chipped into arrow-points should have been utilized for scrapers, many of which are the exact *fac simile* of what Lubbock has illustrated as the Eskimo and others of the European type, of which he says:

"It is curious, that while these spoon-shaped scrapers are so common in Europe, they are very rare, if indeed they occur at all, in North America south of the Eskimo region."

I think it most probable from their close resemblance to refuse flakes and chips they were overlooked by early collectors. In the great game districts of the West, both in flint workshops and among the waste of Indian settlements, they are much more abundant than arrow-heads, or any other implements, with the exception of the small flint knives.

It is also in these game districts that what is known as the "bevel-edge arrow-points" are found, that have been a subject of much discussion as to their use. Foster says of the one he has illustrated: "The specimen represented is from Professor Cox's collection, and the two edges are symmetrically beveled, as if to give it a rotary motion." I have met many others that accept this idea, unmindful of the fact that a ship is not steered at its stem, but by the rudder, at its stern, and an arrow is not directed or held to its course by its point, but by the feather at the butt end of its shaft; and if a rotary motion was required it would naturally be given by placing the feathers spirally around the shaft. The broat flat sides of these beveled points would neutralize any effect from the short bevels in passing through the air.

I have heard it urged that they were reamers, and that the uniform bevel being in one direction, to cut as reamers they would have to be turned to the left, or, as our workmen say, "against the sun." From this it has been argued that the people who used them belonged to a left-handed race. The direction and uniformity in the bevels is to me evidence of exactly the reverse. Among all the points we find they are the simplest and easiest to form by chipping when laid on their flat. Nothing but the down pressure of flaker is required to separate a chip from a flat at a 45-degree angle. Suppose a flake that had been roughly shaped held flat on a block of wood by the fingers of the left hand, the tool in the right hand chipping from the point to the broad end by direct down pressure; then by turning the flake over and working the other edge in the same manner, we have in a center cross-section a form resembling a long-stretched rhomboid with sharp cutting serrated edges at the acute angles.

Colonel Long said that 2 inches was the greatest length of stone arrow-heads that he found in use among the Indians; that all longer not used for javelin and spear-heads were strongly hafted and used as cutting implements. This was confirmed by Catlin. It is more where and under what circumstances we find a stone tool than the tool itself

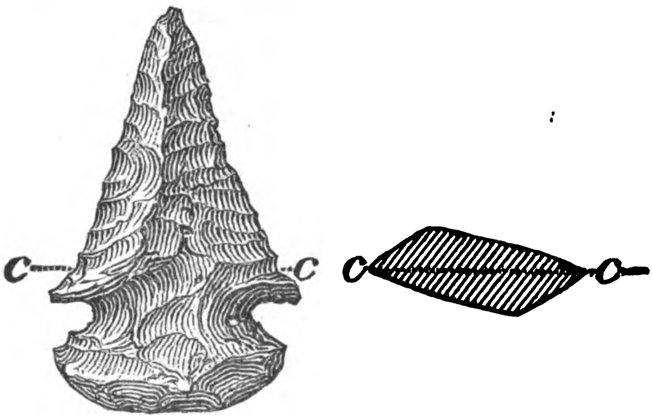


FIG. 8

that teaches its probable use. In the case of the bevel-edged points, all I have found have been among waste where the users have lived, done their cooking and skin-dressing; and these were always associated with broken bones, muscle shells, fragments of pottery, flint knives, scrapers, &c., never scattered as if lost in hunting, as we find arrow-heads. One peculiarity of the bevel point is its strong, massive shank to secure it to a shaft or handle. This is shown in Figs. 8 and 9, with their cross-sections on the dotted lines; they are both of very dark, hard chert. Fig. 10 is from Bath County, Kentucky, near the Upper Blue Lick; it is of beautifully striped jasper; two sections are given to show the great thickness to give strength to the cutting-edges Fig. 11, yellow jasper; the want of symmetry in form is most probably the result of sharpening by fresh flaking. Fig. 12, a beautiful specimen of workmanship, showing a different mode of attachment to a handle. All the above are drawn full size. In a small cache of leaf-shaped implements were found six of the bevel-edged points, all broken off at the shank in precisely the same manner,—pretty conclusive evidence of hard service, and probably brought to the workshop to have new shanks formed and to be re-hafted.

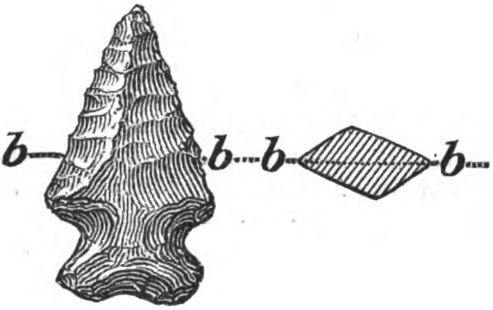


FIG. 9.

(Half size.)

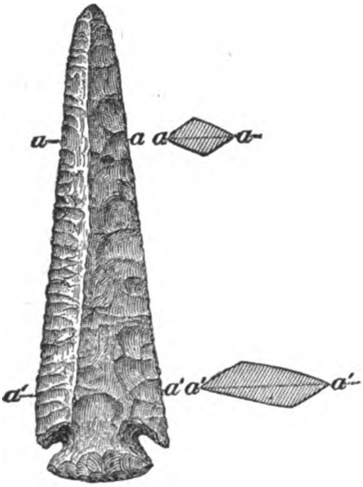


FIG. 10.

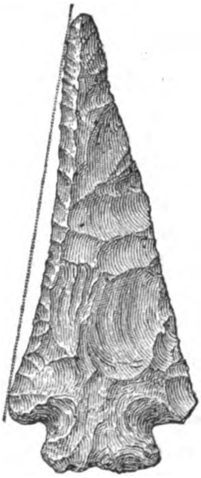


FIG. 11.

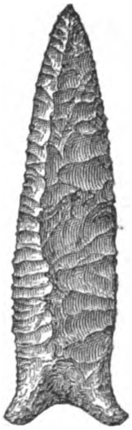


FIG. 12.

The only effort at drilling or piercing that I have found among the rubbish is a piece of yellow fluorspar 2 inches long, roughly rounded to 1⅛ inches diameter; in one end a hole one-fourth inch in diameter has been drilled three-fourths inch deep; at the other end, a hole one-eighth inch diameter and only one-fourth inch deep. Many pierced implements have been found at or near dwelling sites associated with this flint manufactory, such as banner stones split through the drilled eye; some split fragments of tubes of great length, made out of hard schistose slate.

Among the waste are pieces of specular iron ore from Missouri, in evidence that it was worked here, probably into axes and weights or plumb-bobs. There is also evidence that argillaceous iron ore, the clay iron stone or carbonates of the coal measures, was a material extensively used. From the various forms of much oxidized pieces that I have found that will not bear handling, they appear to have been cutting or carving tools, probably used in the manufactories; though axes and celts made from this material are occasionally found in the vicinity of the salt licks, always deeply oxidized, peeling off in flakes that conform to the original form of the implement.

Many scooped or hollowed out blocks of sandstone or large flattish river bowlders, mostly sunk on both sides, that are classed as mortars for crushing corn, and with them crushing stones and pestles, have been plowed up on this flaking ground, but they are much more abundant on the dwelling portion of the ridge; also river pebbles partly pecked to an edge for celts, some of them roughly grooved for axes; but what surprised me most was the great number of what have been called cup-stones, by some nut-stones. These are frequently found scattered over Southern Illinois and Western Kentucky, and occasionally on all the tributaries of the Mississippi. But here they are found in mass. When the ground was first put under cultivation none were seen, and it was not until the great denuding floods had passed over it that they were exposed. On finding, just above the surface of the ground, the face of a fine specimen that showed a number of cups, I loosened and turned it over to examine the cups on the under side, and found it was lying on top of another. With pick and spade I soon exposed a group or pile of over twenty, and with them a number of slabs of the same sandstone that showed marks of having been used as rub or grindstones, all from the millstone-grit series from the bluffs on the opposite side of the Saline. Further research developed a number of such piles, some only having the cup-like indentations, as illustrated at page 40 of No. 287 of the Smithsonian Contributions to Knowledge; others having a center depression of from 4 to 6 inches in diameter, similar to the rude mortars with the cups irregularly arranged around them. Subsequent overflows exposed many scattered over the entire flaking ground; they varied in size from large pebbles with a single cup on opposite sides, known to the early settlers as having been used by the Indians as nut-stones, up to massive slabs, having from two up to eight and ten cups on a side, some too heavy for me to lift into my wagon without assistance (the largest I have seen was taken from near the center of a large mound in Bath County, Kentucky; it had twenty-seven cups one side and a greater number on the other). Many have been carried away from the flaking ground and used as cornerstones for log cabins or built into hearths and fire-backs to their wooden curb fireplaces, with their stick-and-clay daubed chimneys. So many being found where the manufacturing of stone implements has been so extensively carried on is suggestive to a mechanic that they were either made on the ground and kept on hand for sale, or they were tools in some way used in their works. That they were newly made can hardly be the case, for very frequently one cup has been worn into another. This, considering their sharp grit, rather points to some grinding process. Had they been for paint receptacles or pallets, we would expect to find them at dwelling places (where the Indians would naturally do their dressing and painting), and not in their workshops.

On the opposite side of the Saline River, due south of the flaking bank, a spur from the main ridge terminates abruptly by a very steep descent to the bottom lands, which at this point have a breadth of about 50 yards; at the foot of this bluff are masses of sandstone; they also project out of the steepest portion of the earth (at a time long past about 100 feet high), from the top of which the ascent is gradual to the crown of the ridge, forming a beautiful inclined plateau extending with the ridge until it is lost by steep inclines into the valley of the Little Saline, a small tributary that has cut through the ridge and falls into the Saline 1½ miles above its junction with the Ohio, and midway between its mouth and the first ripple. This plateau, when I first saw it, in 1854, was covered with heavy timber, many trees being from 5 feet to 6 feet in diameter. The broad valley of the Little Saline had some portions that are above the ordinary overflows cleared and under cultivation as early as 1834. The slope from the ridge to the Saline, including its bottom lands, have been under process of clearing since 1859. After the plow had loosened the soil, and it had been washed by the rains, both the slope and thebottoms have been rich in stone relics, the bottoms—particularly, in the agricultural implements of the Mound Builders. Climbing the steep directly opposite the flaking bank, chips of chert are found mixed through all the soil that has been worked from above, changing the rock bluff into the present steep incline, on the top of which on its turn from the steep to the gradual slope, another flaking place has been exposed. There within a space of two acres and not over an hour's tramp, on the fresh-plowed earth, I found scattered over twenty specimens of the cup-stones, which I collected and piled in a heap. This is another instance of their having been left among the offal of a workshop.

In the valley formed by the junction of the Big and Little Saline, occur extensive earth-works, long walls, mounds, &c. The largest of the mounds has a height of 25 feet, length of base 225 feet, and width of 175 feet; its oval, truncated top is about 35 by 70 feet; its direction lengthwise is north 12 degrees west; it has a graded way on the east side, and was originally faced with stone; over one hundred wagon-loads have been taken from it and used in walling drains.

The earth-work and mounds extend on to the ridge to within one-fourth of a mile of the flaking ground on the bluff, thus connecting all these works. On the spurs near the Sabine are cemeteries and sepulchral mounds, from which many human bones have been turned out by the plow. I have opened several of the mounds, one of which, from a mechanical point of view, possessed great interest, for the primary interment over which it was raised was that of a worker in stone; and who knows but he may have been at a time the master mechanic or chief superintendent of the great flint works? The center of his mound was paved with the valves of the muscle shells of the Sabine, laid on the levelled surface of the natural soil in concentric rings, with the convex sides up. This shell pavement was about 7 feet in diameter; on its center was a pillow composed of twenty-seven pebble rub-stones of various grit and differently shaped edges. On these the skull was laid on its side; it was far gone in decay and crushed out of shape; the teeth much worn; the position of the large bones that escaped decay showed the man had been bent, bringing his knees near his chin, and laid on his side. He was a man of massive frame; the femur measured 19 inches and the tibia 15¼ inches long. Close to the crown of his head stood a rude clay vessel, badly broken; in front of the skull, on the rub-stone pillow, a gorget, finished with the exception of drilling hole for suspending it, on which lay a plumb-bob, a stag's tine scraped to a point; this broke to pieces on removing it. There were some bone splints, two canine teeth of a wolf, some pieces of galena, one crystal of mica one-half inch thick (the plates had not been parted), a few chert flakes, and a single finished arrow-point: on the shell floor of the mound, near its outer edge, one of the mysterious cup-stones, with three cups on one side and four on the other. I could not see that it had been placed with any reference to the center skeleton, but close to it, on the shell floor, lay a small-sized skull in a better state of preservation than the central one. A large hole in the back of it showed it had been crushed in, the broken portions either having been removed or decayed. Close to it lay the deadly slingstone, of roughly shaped chert. The decayed and broken bones of this skeleton had been thrown out in removing the earth from the shell floor, so that its position could not be accurately ascertained, though from portions of bone still remaining after the skull was discovered it was evident that the entire skeleton lay on the shell floor, and close to the central one, and was no doubt a primary interment.

Among these earth-works, where the densest aboriginal population have left their marks, stands a farm house and its outbuildings, with its garden on a pre-historic cemetery. From this point radiated the early clearing and cultivation that has been most destructive to the long wall earthworks, and was the place of all others where I expected to find the cup-stones. The single-pit nut-stones and indented hammer-stones were plenty, and also the rude mortars, but the cup-stones were comparatively few.

An aged farmer, whose father with his family emigrated from Virginia into this section when it was Indian territory, and who as a boy worked at the early salt works, tells me that the Indians then here used the single-pit nut-stones, but they did not know anything about the cup-stones. He asked me if I could divine any use for them. On my suggesting grinding he said I was wrong and that he could tell me their use. I will now give his explanation as near as I can in his own language. He said: "If you want to see them in daily use, go to Patagonia, and you can any day see a lot of women squatting around one of these stones spinning yarn and talking scandal. You see, they strip and singe the hair off of a piece of raw hide, lay it on the stone with the flesh side up; they then squeeze it into the cup holes and put something on to hold it while it dries. Then you see every cup makes a step for the foot of a spindle to rest in, and holds just enough grease in it to make the spindle run slick; and, depend on it, that is the way the thread was spun here to weave the cloth that has left its impressions on the pieces of the old clay salt-pans. You know that our Indians did not know anything about them, or of salt either, for that matter; so how could they know what these stones were used for?" I understood him to say that when a boy he learned this from a Pacific whaler, who drifted to the salt works, and who related that on one occasion the vessel he was on laid up for some time in the Straits of Magellan, and that he then saw the Patagonian women using just such stones as steps for their spindles.

If that could have been the use of those that are so abundant here, we should expect to find them where the women dwell rather than at the flint workshops, the same reasoning applying to their use as paint pallets. If used for either of these purposes, why do we find the cup depressions on both sides, and many of the cups of various size, some just started and others worn one into another?

From the fact of the upper stone of the piles as they were left on the flaking ground being covered with such a depth of vegetable mold as not to have been discovered until after cultivation and exposure by the denuding floods, the finding one in the mound with the decayed skeleton of a stone-worker, the one I have before referred to as having been found near the center of a large mound in Kentucky, leaves little room to doubt of their having been, as well as the primeval workshops, coeval with the earth-works and their associated mounds.

There are other evidences of great antiquity in the condition of many of the granite and porphyry implements being honeycombed by the disintegration of their feldspar, leaving the silicious portions rough and projecting. Celts and fleshers made of the carboniferous limestones have the silex skeletons of their fossils sharp and clearly marked.

From the location at the first ripple of the Sabine as a fishing point, the proximity of the salt-licks for the larger game, no doubt the place was frequented, if not permanently occupied, by the last of the Indians in this section, who have left their stone implements scattered broadcast over the country. They had lost value by the introduction of the nailers iron points, the rifle, knives, and the usual stock of the Indian trader. Had not this paper extended far beyond my original intent, I could give an accumulation of evidence of the rapid decline in the art of flaking stone.

From a mechanical stand-point, it is hard, if not impossible, to reconcile the accepted evolution of works of the stone age from flaked to ground and polished implements. It is true that specimens are found in all stages of progress from rough flake to polished implements in America as well as in Europe. But here in America, where the true flint is absent, a greater range of stone has been resorted to, and what we find flaked and afterwards ground and polished are mostly cutting tools, such as chisels, gouges, &c., of chert, jasper, or fine-grained quartzite that will maintain a keen cutting.edge.

For axes, either plain or grooved, the water-worn pebbles of greenstone, granite, or porphyry have mostly been selected. For fleshers, softer stones are common, such as limestone of various qualities, steatite, occasionally cannel coal, and the harder shales of the coal measures have been used for these wedge-shaped implements. But let the material be what it may, the pecking with a hard stone on a water-worn pebble, often found nearly of the required shape, to modify and bring it to a cutting-edge ready for grinding, by simply rubbing with sand and water on a flat stone, only required labor, patience, and perseverance, but not the knowledge and skill requisite to split off the flakes, nor the judgment, steady hand, and correct eye to shape them into the exquisitely symmetrical forms we find them.

I am not writing on or questioning the evidence of the antiquity of man, but simply on the instruments and tools he would naturally resort to, in his primitive state, to sustain life when depending for food, on the waters for fish, the earth for fruits, seeds, nuts, and roots, and on the chase for animals, not only for food, but, what was most essential for his comfort, skins for clothing, sinews, bone, and horn for innumerable uses. With the aid of a sharpened pebble (stone ax) he could attack a forest tree, and by the aid of fire shape its wood to his uses. Most probably scraping came in advance of cutting, and what could be better adapted for this purpose than the sharp edges of fractured flint pebbles?

With the wooden bow and arrow arose the necessity for an arrow-point harder than wood. If bone was used, the pebble scraper was essential. The river drift or gravel bars, when subjected to the grinding and crushing action of drift-logs or rolling bowlders, would furnish many suggestive forms and shapes that a little ingenuity would apply, and out of which would naturally grow the art of flaking.

The streets of Paducah, Ky., are paved with partly rounded, angular, silicious gravel, mostly of jasper. Seeing heaps of this ready for spreading, I was struck by the many forms, mostly highly water polished, that if found on a flaking ground would pass for refuse flakes and rubbish left by the workmen.

On inquiry I was informed that this coarse gravel was from banks on the Tennessee River above the ordinary overflows. I selected many forms that any archæologist would pronounce to be the work of man.

A heavy wagon, loaded with hogsheads of tobacco, drawn by five or six yoke of oxen, passed over the fresh-spread gravel with a sharp, crushing, grinding sound. On examining the wheel tracks I was surprised to find the slight impression the iron tire had made on the surface stones. They had been pressed aside from the wheels, leaving a slight rut, those under the wheels compressed together, but very little broken; not sufficient to account for the sharp, crackling noise made as the wagon-wheels passed over them. On examining the effect from the tread of the wheels to the old road-bed, a depth of about 6 inches, I found most of the larger gravel stones under the top layer split, some into flakes, the fractures in various directions, some crossing others. This spread from the width of the wheel-tires to about three times as wide on the old road-bed. Many of the fresh fractures presented the forms and appearance of genuine cores, and would be mistaken for the work of man. It was a beautiful illustration of the effect of pressure on small points of contact. Our lady friends, often inveterate iced-tea drinkers, when they find a lump of ice too large for their glass, will, with a common toilet-pin between thumb and finger, press its point into the ice, tap its head with the handle of a case-knife, or give it a click with a thimble. The cohesion is destroyed and the ice splits with just such a fracture as is made by impulsive point pressure on the more tenacious and refactory chert.

These Paducah observations led to considerable investigation as to the action of lodged drift-logs on gravel-bars, and finally to an experiment that I should recommend the Smithsonian Institution to try on more extensive scale than I was able to.

I filled a metal cylinder with pebbles of various sizes and shapes, brought a pressure by a screw on them through a plunger; immediately a crepitating sound was heard, which as the pressure increased became sharper and louder, at times almost explosive, as the interstices became filled with broken fragments, producing side pressure and cross fractures. The sound became more confused and died away. On emptying the cylinder, the result was many representations of the rude implements found in the drift.

COPPER IMPLEMENTS FROM BAYFIELD, WISCONSIN.

By Colonel CHARLES WHITTLESEY, *of Cleveland, Ohio.*

In grading the streets of Bayfield, Wis., about the year 1864, the workmen found a copper implement in the gravel. The accompanying figure, one-half the natural size, will give some idea of the shape and character of the specimen (Figure 1). *A* is an upright outline or elevation, with the concave surface toward the rear. *B* is a top view or plan of the implement as seen from above, and *C* a vertical or longitudinal section through the middle at the dotted line *c d*. The irregular space *e e* shows a flaw in the metal.

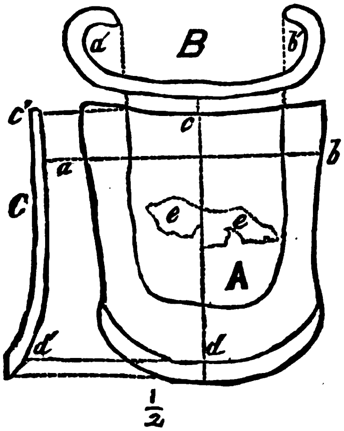
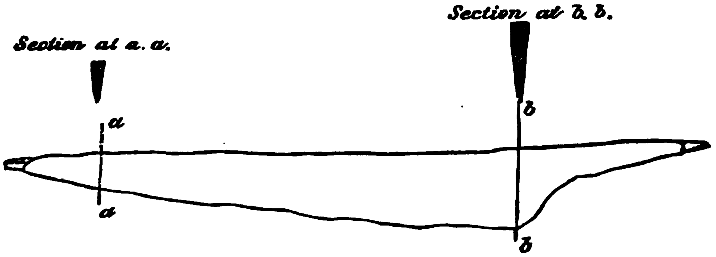


FIG. 1.

Several have been found elsewhere in the United States and Canada of about the same outline, but generally the blade or flat part is much larger in proportion to the shank or socket. Where the two parts are equal they are regarded as spades. One described by Mr. Squier in "Ancient Monuments," taken from a sepulchral deposit near Brookville, Canada, is about 10 inches in length. It could be used in digging by inserting a handle several feet in length, with a notch or offset for the foot near the bottom.

Those with the short bit may have been spades worn out by use. Their edges are generally sharp, as though they had been used to cut wood or some other hard substance. After they were well worn as spades they could be turned into an adze by inserting a crotch, with the plane of the blade at right angle with the plane of the handle, or into an ax by making the planes coincide.

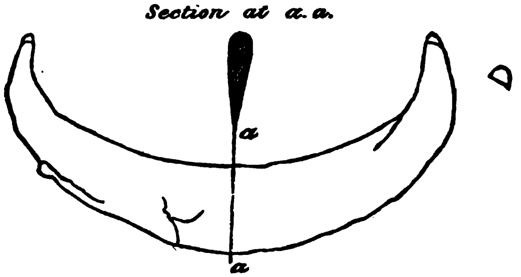


Found in 1866 on Presque Isl. one of the Apostle Group Lake Superior: on the Surface.

Copper Knife from Bayfield. Wisconsin.

FIG. 2.

Figure 2 represents a copper knife (half-size) found on Presque Isle, one of the Apostle Group of Lake Superior, in 1866. It was lying on the surface of the ground, and is now in the possession of Mrs. E. M. Haywood, of Bayfield, Wis. The thickness near the ends is shown by the cross-sections at *a a* and at *b b*.



Copper Cutting tool from Knife River: Minn.

FIG. 3.

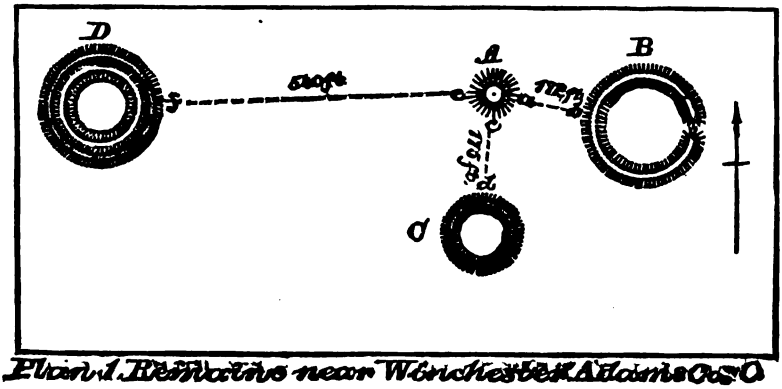
Figure 3 represents a copper cutting tool from Knife River, on the northwest shore of Lake Superior, Minnesota. It was found in 1865, and is now in the collection of the Western Reserve and Northern Historical Society of Cleveland, Ohio. It was evidently cold-hammered, and the surface is rough from corrosion.

ANCIENT REMAINS IN OHIO.

By J. P. MacLean, *of Hamilton, Ohio.*

Works near Winchester, Adams County, Ohio.—Winchester Township is located in the extreme northwestern corner of Adams County, Ohio. The terminal moraine of the great ice age enters the township at the northeastern corner, extends diagonally across it, and passes out at the southwestern extremity. The township, for agricultural purposes, is the richest in the county. The soil, for the most part, is poor, known as cold clay, and the surface broken by the tributaries of Brush Creek.

North of the village of Winchester, a distance of one-half mile, is a series of circular works, which for fifty or more years have been plowed over. Near the center of these works is a mound (*A*) (Plan 1) 8 feet



Plan 1. Remains near Winchester, Adams Co., O.

high, conical in form, which has never been disturbed by the plow From the top to the bottom on the east side is 50 feet; from top to circumference on north side 48 feet. East of this mound (*a b*), a distance of 172 feet,is the circle *B*. The wall is almost level with the surrounding surface, although from 6 inches to 1 foot high along the line *g b h*. The remaining part of the work is difficult to trace. The gateway cannot now be located, although it is said to have faced the east. South of the mound (*c d*), a distance of 175 feet, was formerly another circle (*C*), but no trace of it exists at the present time.

West of the mound (*e f*), a distance of 540 feet, is the circle *D*, 150 feet in diameter. This work presents a wall averaging from 10 to 15 inches in height with a ditch in the interior. I was unable to locate a gateway.

When first discovered these works were covered with forest trees. The walls averaged 5 feet in height. The material is composed of clay of the same kind as that in the immediate vicinity. The mound has never been opened. The spot is level, and appears to have been well chosen. Following are the measurements:

(*A*.) Conical mound, 8 feet high; east to top, 50 feet; north to top, 48 feet.

(*B*.) Circle 172 feet east of mound. Circle 510 feet in circumference.

(*C*.) Obliterated circle 175 feet south of mound.

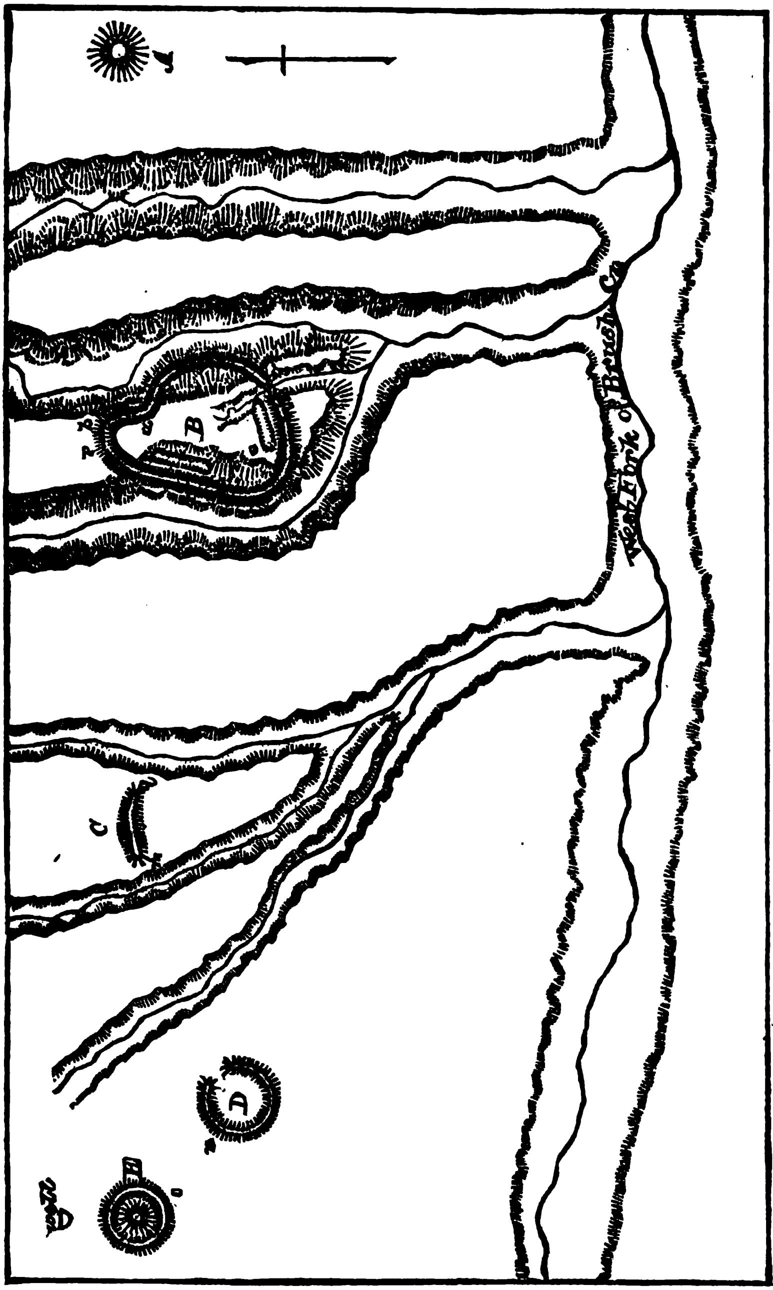
(*D*.) Circle 540 feet west of mound. Circle 150 feet diameter.

One mile and a quarter north of these works, located on a high point of ground, is a mound (Entry No. 3, Map *b*) removed a few rods west of the Hillsboro' turnpike. The mound is conical, 14 feet in height, with a circumference of 250 feet at the base. Original height, 20 feet; solid contents, 2,098 cubic yards. From its summit a fine view of the country may be obtained.

On Entry No. 8 (see map) is a small mound (*c*) 3 feet in height.

Works in Eagle Township, Brown County, Ohio.—Eagle Township (see map) is bounded on the north by Highland County (White Oak and Concord Townships); on the east by Adams County (Winchester Township); on the south by Jackson Township, and on the west by Washington Township. The general surface is comparatively level, although the west fork of Brush Creek has made a deep valley running from west to east. Some of the tributaries of this stream have formed deep ravines. Where these ravines have cut through the glacial till the Hudson River blue limestone is exposed, save in one spot (see map Z, entry 398), I noticed Clinton strata.

The ancient remains located on entries 398 and 1316, in company with Prof. J. W. Fertig, I measured, May 16, 1885 (see Plan 2). The mound *A* is located on the line between Brown and Adams Counties. It is located on a knoll, several of which occur in the immediate vicinity. It is difficult to tell just where the base of the mound begins. If the place I assumed to be the base is the correct one then the mound is 328



Plan 2. Remains in Eagle Tp., Brown Co., O.

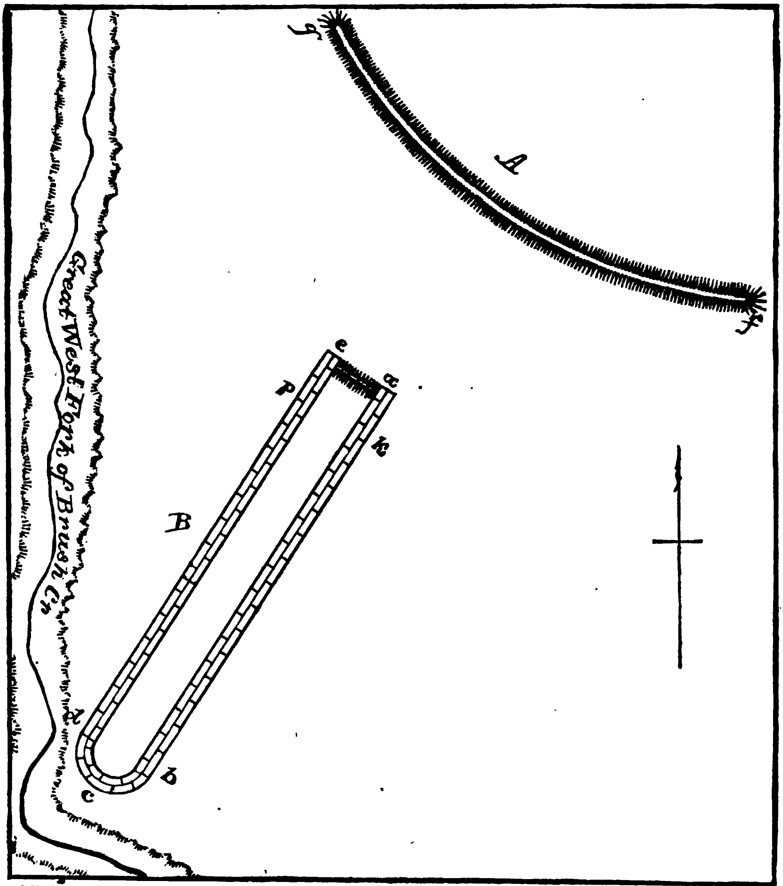
feet in circumference; from northwest base to top, 70 feet, angle 11°; southeast to top, 44 feet, angle 15°; solid contents, 1,533 cubic yards; height, 14½ feet. A view of the country to the southeast is here presented.

Measuring due west and passing through two deep ravines we come to fort (B), striking it at *a*, and removed from the mound a distance of 1,970 feet. This work is entirely surrounded by deep ravines, save a narrow strip of land at the north. That part of the wall marked *p c h d e g* is in woodland. From *p* to *h* the wall is about 18 inches high; from *h* to *d* not over 12 inches, while from *e* to *g* it will average 32 inches. A ditch in the interior extends from *c* to *h*, also from *e* to *g*. The highest point of land is at *p*, thence the wall extends rapidly down the ravine until it is almost level with the bottom at *s*, thence it rapidly rises to *e*, then declines to *g*. From *g* to *a* the wall is entirely obliterated, that part of the work having been under cultivation for the past forty years. From *e* to *b* is a gradual ascent, the distance being 985 feet. The distance from *a* to *b* to *c* to *d* is 1,291 feet; from *d* to *e* 75 feet, and from *e* to *g* 130 feet; from *a* to *b* 300 feet, and from *a* direct to *c* 400 feet; from the point *c* (*B*) we started directly west a distance of 1,875 feet, as we measured it. This number must not be relied upon as being correct. Owing to the density of the underbrush on the west side of the ravine we were forced to deviate from a straight line, but the result was as near as we could reach it without cutting a straight path. At the end of the distance measured, and between two small ravines, on a piece of land sloping to the southeast, is an arc of a circle (*C*) 288 feet in length. The wall has been plowed over for fifty years, yet is 2 feet in height, with a base 20 feet in diameter, and accompanied by a ditch in the interior.

Measuring westward 1,993 feet, and through open grounds comparatively level, we reach the mound *E*. This mound is 332 feet in circumference at the base; from north side to top, 44 feet; from south side to top, 44 feet; across the top, 21 feet; slope angle, 34 degrees; height, 24½ feet; solid contents, 2,516 cubic yards. It is perfectly symmetrical; commands a fine view of the surrounding country; has never been disturbed by plow, pick, or shovel, and is one of the most beautiful mounds in the State. It is surrounded by a circle 160 feet in diameter. The circle, however, is plowed almost down to the general level of the surface. There are indications of a gateway at the east. At a distance of 640 feet southeast of the mound is the circle *D*, 865 feet in circumference. The original height of the wall was 10 feet. It is now about 2 feet, and 40 feet in diameter at the base. The gateway is towards the northeast.

Due north of the mound a distance of about 300 feet was a walled well. The history of this well is not known; it was there when the first settlers came. It has been filled up, and now plowed over.

The whole distance from the foot of the mound *A* to that of *E*, as measured, is 6,526 feet. The figures run 1,970, 1,875, and 1,993. The difference between the two opposite figures is 118 feet. The average distance would be 1,946 feet, while the average of all, including works not given, 2,175. It is more than probable that some system in these measurements was followed.



Plan 3. Remains in Concord Tp., Highland Co., Ohio.

Ancient remains in Concord Township, Highland County, Ohio.—Three and one-half miles northeast of the mound *A* (Plan 2) are ancient remains (see Plan 3) located on Entry 281, Concord Township, Highland County, Ohio. The spot where these works occur is a secluded one. Great west fork of Brush Creek makes a bend almost at right angles. The land slopes from the northeast. Before reaching the creek a bench is met, upon which these works are built. No view can here be obtained of the surrounding country, because it is literally hemmed in by hills. The most interesting work is the stone structure marked *B* (Plan 3). The entire wall, except from *a* to *e*, is composed of Hudson River limestone. The stone has been burnt, and for a long period exposed to the elements. The wall has been thrown down, yet its regularity is perfectly preserved. The following are the measurements: From *a* to *e* (inside to inside of wall), 32 feet; *b* to *d* (inside to inside of wall), 32 feet; *b* to *c*, 125 feet; *e* to *d* to *c*, 165 feet; *a* to *b* to *c*, 165 feet; thickness of wall across base at *c*, 21 feet; thickness of wall across base at *k*, 24 feet; also same at *p*. Height of stone wall, 2 feet. From *a* to *e* the wall is composed of earth, is 8 inches in height and 7 feet in breadth. The floor on the interior of this work is perfectly level.

Fifty-two feet due north-east of this work is a section of a circle (*A*). The wall has been plowed over, and will not average over 1 foot in height by 22 feet across. The distance from *g* to *f*, following the curve, is 225 feet, and on a straight line 130 feet.

Two hundred and eighty-five feet due east of *a* (*B*) is a mound 3 feet high and 22 feet diameter.

At a distance of one-fourth of a mile northeast of (*A*) is another mound located upon a hill, but not having a commanding view of the country, nor of the works just described.

It is fair to assume that the works near Winchester, those of Eagle Township, and the ones just described, belonged to the same people. There is no evidence that they were constructed in different ages and by different people. The nearness of the structures to each other, and their evidently unfinished condition point to the same time and the same people. On a straight line some 6 or 8 miles east is the Great Serpent Mound. This is removed a distance of about 5 miles from "Fort Hill," in Brush Creek Township, Highland County, Ohio. This work has been figured and described* in "Ancient Monuments," with the additional information that "no other remains, except perhaps a few small, scattered mounds, in its vicinity." Near the southern foot of the hill upon which the fort is located is a series of circular works, now almost obliterated.

It is a fair assumption that the builders of "Fort Hill" and the circles near it belonged to a clan separate, yet related to the one that constructed the works near Winchester.

Now, the so-called "serpent effigy" is composed of a frog, an egg, and a serpent. Why may not one of these clans have been the frog, and the other the serpent, or snake; and the series of the effigies represent that the snake clan came from the frog?

Ancient remains in Clarke County, Ohio.—On May 23, 1885, in company with Prof. J. W. Freeman, I visited the works located on the land of Benjamin Newlove, section 29, Harmony Township, Clarke County, Ohio. When these works were first discovered only saplings were growing upon them. The works are situated on the side of a hill descending towards the northeast (see Plan 4). The larger work is oblong, the longest diameter being 320 feet, and the transverse 250 feet. The gateway *a b* is 33 feet; the entire wall is 821 feet long; the wall at *d* is 7 feet

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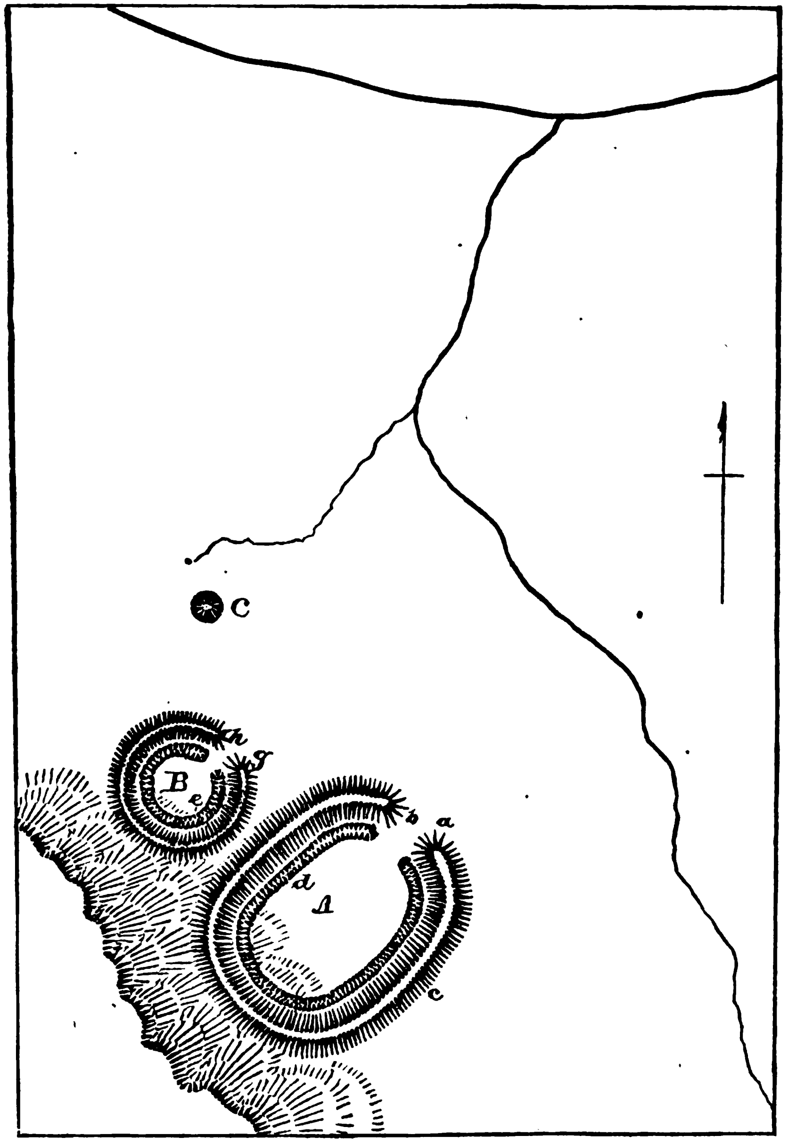
* "Ancient Monuments," page 14.

8 inches high; at *a* and *b* 4 feet high, and 25 feet wide at the base. The width at *c*, 38 feet; at the same point the ditch is also 38 feet across.



Plan 4. Remains in Harmony Tp., Clarke Co., O.

The land at *c* is 15 feet higher than the land at the gateway. The ditch is in the interior, extending the whole distance around save at the gateway. Here the land is perfectly level. The ditch does not touch the embankment. A platform averaging 4 feet across follows between the line of embankment and the ditch.

By the side of the work (*A*) is the circle (*B*). From the bank of one to that of the other at the nearest point is 34 feet. The bank is 560 feet in circumference, to which is to be added 45 feet for the gateway *g h*. The wall is 5 feet high, with a diameter at the base of 25 feet. The work is accompanied by an interior ditch, which, however, does not extend across the gateway. Between the interior foot of the embankment and the ditch is a platform 20 feet in width.

One hundred and forty feet north of the small circle is a circular estufa, walled with small bowlders. Forty feet still farther north is a spring of clear cold water, which has never been known to fail.

A PRIMITIVE STOREHOUSE OF THE CREEK INDIANS.

By CHARLES C. JONES, Jr., *of Agusta, Georgia.*

In his description of the customs of the ancient inhabitants of Virginia, William Strachey[*] says: "Their corne and, indeed, their copper hatchetts, howses, beades, perle and most things with them of value, according to their own estymacion, they hide, one from the knowledge of another, in the grownd within the woodes, and so keepe them all the yeare, or untill they have fitt use for them, as the Romans did their monies and treasure in certaine cellars, called therefore as Plinye remembers, *favissæ*; and when they take them forth they scarse make their women privie to the store-house."

In plate xxii of the Brevis Narratio [Fraucoforti ad Moenum MDXCI], le Moyne de Morgues furnishes a drawing of what, in the accompanying text, is called a *publicum horreum*. It is situated upon the low bank of a river, and toward it canoes—filled with corn and fruits, and propelled by Florida Indians—are tending. Such granaries or public receptacles were, by the peoples dwelling within the limits of the extensive domain then known as Florida, built of stones or earth, and roofed with palmetto leaves and clay. For their location cool spots were selected, where protection was found against the violent rays of the sun. They served as depositories for maize, fruits, nuts, nutricious roots, dried fishes, alligators, deer, dogs, and other jerked meats. Hoards of corn, nuts, and meat are frequently mentioned in the early narratives as existent among the primitive peoples of this region at the time of primal contact with Europeans. They were both public and private.

In alluding to the agricultural occupations of the Southern Indians Mr. Bartram observes: "When the fruits of their labors are ripe and in fit order to gather in, they all, on they same day, repair to the plantation, each gathers the produce of his own proper lot, brings it to town, and deposits it in his own *crib*, allotting a certain portion for the public granary which is called the King's crib because its contents are at his disposal, though not his private property, but considered as the tribute or free contribution of the citizens of the State at the disposal of the King." He further states that the common or public granary served the valuable purposes of assisting the needy when in sore want, of furnishing entertainment for strangers and noted guests, and of supplying warriors with provisions when they were setting out on hostile expeditions.

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[*] History of Travaile into Virginia, p. 113. London. (Printed for the Hakluyt Society, 1849.)

That the American Indians often concealed in the ground and in secure receptacles not only the products of their agricultural labor and trophies of the chase, but also objects manufactured of clay, shell, and stone, is a fact capable of easy demonstration. Without enumerating the proofs, or pausing to cite authorities in support of the frequent use by the Southern Indians in the sixteenth century of storehouses, both public and private, we desire to call attention to the existence of one of these primitive structures upon the plantation of Colonel Seaborn Jones, at Mill Haven, in Screven County, Georgia. For quite a century it has remained unchanged. It is located upon the declivity of the right bank of Briar Creek, in proximity to that stream, and in the midst of a beautiful forest of oak, holly, and pine. Cylindrical in shape, this receptacle has a diameter of 8 feet, and is about 6 feet deep. The excavation in the ground was at first carefully and regularly made and, when completed, the sides and bottom were covered with a uniform layer of well-kneaded red clay 4 inches in thickness. These clay walls, the interior surface of which was pressed hard and smooth, are still quite perfect. As one looks upon the structure, it presents the appearance of a huge cylindrical terra-cotta vessel let into the earth. There is some indication of the action of fire in hardening the walls. To Briar Creek, and especially to this neighborhood, did the Creek Indians resort to fish and hunt. The adjacent bluffs and fields give token to the present day of former and long-continued occupancy. Village sites may still be seen littered with fragments of earthen vessels, flint chips, spear and arrow points, grooved axes, scrapers, and other objects of primitive manufacture. Even now this stream abounds in fishes, turtles, and alligators, and the swamp, at an early period, was filled with deer, wild turkeys, and other game held in repute by the natives.

Doubtless, during the use of this receptacle, it was furnished with a roof or covering which long since perished. It is probable that in it were stored, from time to time, the fishes caught by visiting Indians. These, having been previously dried, there accumulated until the season arrived for the homeward journey, where they were removed and transported to the permanent lodges of their captors. It is hoped that care will be exercised in the preservation of this interesting object.

SHELL HEAPS AND MOUNDS IN FLORIDA.

By JAMES SHEPARD, *of New Britain, Conn.*

In February, 1884, in company with Dr. F. H. Williams, of Bristol, Conn., I visited Palatka. Many walks about the town were covered with small snail shells which were gathered from large deposits in that vicinity. It was a common belief that these were marine shells; and frequent was the inquiry why the Indians brought these shells from the distant sea. The answer is, "They did not," for the shells are mostly, those of the river snail, *Vivipara contectoides* (Binney). Several of whom I inquired thought that like specimens of live shells could not be found near Palatka. In this opinion they are probably mistaken. On being informed that there was a shell heap on the Saint John's River a few miles below Palatka, four of us started out the next morning to explore the land in that vicinity. Late in the afternoon one of our party discovered a shell heap. It was on low ground, in the woods or hummock, probably not far from the Saint John's River, although the river was not visible. It was literally a heap, quite irregular in form, covering three or four square rods of ground and varying in depth from 2 to 5 feet. It was just such a heap as one would expect a pile of débris to be. There were no indications that any shells had been removed or that the heap had ever been dug into. On the surface the shells were but little broken, and the entire heap appeared to be composed of two kinds of shells, the *Pomus depressa* (Say) and *Vivipara contectoides* (Binney). By digging below the surface, pieces of river mussels or *Unios* were found, very much decomposed and covering the other shells with a nacreous paste. Bones of small animals and birds and flint chips were numerous, with many pieces of pottery and an occasional arrowhead. There were only a few shells in the entire heap of any genera other than the *Pomus*, *Vivipara*, and *Unio.*

On sailing up the Saint John's River we saw several shell heaps on the banks of the river apparently of the same general character, only some of them were much more extensive. We stopped only at Sanford, and there found a shell heap a mile or two below the steamboat landing. This was much larger than the Palatka mound and spread irregularly over the ground. Shells had been carted away from here and the heap dug into in many places by relic hunters. All of the shells were of the same three kinds, *Pomus*, *Vivipara*, and *Unio.* The shells at the surface were very much crushed, indicating that they had been much trodden on. Many pieces of pottery were scattered about over the surface, and others were found by digging. Arrowheads and flint chips were infrequent. In some places indications of ancient fires were found, the shells being burned and firmly cemented together. Below the layer of cemented shells and ashes the shells were found in a remarkable degree of preservation, some of the *Vivipara* showing the four bright brown bands about the body-whorl quite as distinctly as in the day when they were taken from the water. Others seemed to have changed their substance, and were white and glossy with a porcelanous appearance. Here, too, we found a lump of hardened red paint. Some pieces of pottery were perfectly plain, while others were ornamented in various patterns both by scratching and by depressions. Some of the checkered ornamentations seemed to have been made by repeated impressions with a stamp, such as would be produced by making channels in a flat surface at regular distances apart and at right angles to each other, and then, in using the stamp, turning it between each two impressions so as to make the lines in one depression stand obliquely to those of the adjoining one. At the junction of two such depressions the overlapping or intermingled lines were plainly visible. One piece was ornamented by straight parallel depressions, and then, after the depressing implement was withdrawn and while the clay was yet soft, other depressions were made transversely to the first ones, but not so deep, the ribs between the first depressions being flattened down on the cross-lines and partially filling the first depressions. One piece was found of such an arc, that supposing it was from a round vessel the diameter of said vessel was 29 inches.

Near this shell heap were two mounds of symmetrical shape, formed mostly of earth, but partly from shells like those in the heap. The earth was the same as the surrounding soil. These had been dug into considerably, and on digging farther into one of the holes we found the leg and foot bones of a human skeleton, but no implements or ornaments.

In returning we found by a ditch on the flats of the St. John's River, a smaller shell heap of fresh shells, but not thick enough to cover the ground. The shells were identically of the same three kinds. The fresh operculum lying by these shells showed that they had recently been taken alive, and that their meat had been picked out by some small animal.

The long-billed curlew (*Numenius longirostris*) is said to eat the live animal from these shells. These shells were of great interest to me for they put at rest all speculation as to where the Indians obtained their supply of food, of which the shell heaps are the refuse, and proved to my mind that they took their shell-fish from the river whose bank they have lined with shell heaps, and also that the same species of mollusks are living there to-day. Undoubtedly this fact has been noted and published before, but there are many who still believe that the shell heaps of the St. John's River are composed of marine shells. When we consider the resemblance of the *Pomus* to the *Natica*, it is not strange that such opinions may be formed by a cursory observer.

Our next stop was at Tampa, Hillsborough County, and our first excursion was to Rocky Point, Old Tampa Bay, about 5 or 6 miles westerly from Tampa, near where the salt works were located during the civil war. Here was a large mound of marine shells situated at the base of the point and extending entirely across it. Oyster shells formed the major part of the pile. Several holes had been dug into the surface which, with the general appearance of the place, indicated that it had frequently been visited. The rocks of which the point is mainly formed and from which the point was named, consists of fossil coral. The material for many of the rough implements found in this vicinity evidently came from this point.

Most of the surface specimens yielded by this heap were found at or near the base of the slanting sides of the pile. In addition to arrowheads, scrapers and rough-shaped implements of quartz, we found pottery and quite a variety of shell and bone implements, the latter being entirely new to us. Among these were several celts quite similar to those illustrated in "The Archæological Collection," p. 67, figs. 254 and 255, also chisels, gouges, pendants, and beads made from the columella of large shells, and smaller chisels made from bone, besides other rough pieces which we suppose were implements of some kind. One piece of pottery was ornamented with impressions of a long spiral shell of the genera *Cerithum*. Near by we found large numbers of live specimens of this shell, some of which quite closely fitted the depressions in this piece of pottery.

On the land of Colonel Culbreath, about 2 miles from Tampa, and on the shore of Old Tampa Bay, is what is termed a "shell hummock." It is cultivated as an orange grove and a market garden. It was probably once an immense shell heap, but now it is scattered over several acres. A little to one side of the center of the lot the ground is slightly elevated and nearly or quite half of the surface material is shell. From this point the shells are less numerous, as they are spread out in all directions, growing gradually less until the soil is free from them. Here we found an abundance of quartz implements and worked pieces of ill-shaped forms, that might or might not have been intended for implements. Others were of fossil coral limestone, like the coral at Rocky Point farther up the bay. Some pieces of the quartz and coral were nearly spherical, the whole (in some cases only a part) of the surface having been formed by chipping. Perhaps, in the absence of natural pebbles in this section, these had been worked out for use as a substitute; perhaps to use as club heads, incased with rawhide. We found rough and somewhat rounded pieces of fossil coral with pit-holes on opposite sides, and a single piece of soapstone, about one and a half inch in diameter by half an inch thick, but its surface was not worked sufficiently to show its use. I refer to it only because it is a material which has not to my knowledge ever been found in nature within several hundred miles of South Florida.

Of shell and bone implements we found all the kinds collected at Rocky Point, celts, gouges, pendants, beads, and also the columella of small conchs, worked into small round shafts pointed at each end. Some of the columella of the larger conchs were worked to a point on one end. There were triangular and other shaped pieces of the shells of the common hard-shell clam worked to a sharp edge on all sides. One spoon was made from the umbo of one of these clam shells, another from the outer whorl of some large conch. We also found beads made from the *Oliva literata*, as illustrated by fig. 260, p. 69, "The Archæological Collection," and large conch shells, perforated and worked to form club heads. Some were minus the hole in posterior surface of the spire, but were otherwise exactly like those described by Dr. Rau on page 66 of said book. A friend of mine has a similar supposed club head from South Florida, consisting of a like conch shell worked in the same manner at the small end and perforated by two holes in the outer wall, but without the notch in the outer lip, so that the handle passed to the right of the columella instead of at the left. The necklace or bead conchs having two holes and truncated at the apex like fig. 257, p. 69, we also found, and it was the first time our attention had ever been called to them. We wondered if they might have been toy club heads for children, but Dr. Rau's book informed us otherwise. In most of these shells the perforations have been so formed that when strung and disposed about a person's neck or chest, the lips and the most brightly colored parts of the shell would be exposed to view. One small disk from a hard clam shell having ragged edges and a beveled perforation in the center was found. The hole was almost identical with those made by boring worms and shells, and one person who saw it was confident that this was only an accidentally broken piece having such a worm-bored hole. Upon having his attention called to the fact that the bevel was at the inner surface of the shell, he was willing to accredit the supposed work of a worm to an Indian. I mention this to show the importance of close observation and how a very little thing may often decide a question. A workman in the field informed us that he often plowed out parts of shells that had been engraved. We visited the hummock several times but found nothing of the kind. At last the workman found one and showed me. It was nothing but a plain unworked columella with the outer whorls broken off undesignedly. He had mistaken the natural spiral lines for carvings. This is about as reliable as the information one can get from those who have never paid special attention to archæological specimens. Fragments of pottery of various patterns were abundant here. The shells were all marine shells excepting such land shells as had probably found their own way to that place.

By Hillsboro' Bay, at the mouth of the Alifia River, several miles below Tampa, is a shell heap called "Bull Frog Mound," so named from the fancied resemblance of its shape to a bull frog when viewed from the water in sailing up the bay. This is by far the most extensive shell heap of any that we visited. It is formed of two mound-shape piles at considerable distance apart, while all the ground between these piles is covered with shells to the depth of several feet. The larger pile is reported to be 60 feet high and stands close to the river; in fact the shells extend well down into the river as if filled in beyond the original bank, so that the mound itself, at this point, now forms the river bank. A large oak tree stands at the very summit of the mound. The lesser pile has been considerably reduced by burning the shells for lime. In front of the mound, looking towards the bay, is a point consisting of a flat salt marsh covered with rushes. The mound is composed largely of oyster shells and appears to have been frequently visited of late. Relics were scarce, and those we did find were of the same class as we had found before. The only relics which could be found here in numbers were the small perforated and truncated conchs for necklaces or beads.

Bordering on the city limits of Tampa, Hillsboro' Bay, and the mouth of Hillsboro' River, is the garrison called "Fort Brooke." Here are two ancient earth mounds which have been dug into considerably, but we could not learn that anything of special value had ever been found. On the ground about the mounds we found bits of pottery, flint chips, a few arrow heads and rough implements. I here found a genuine quartz pebble, about 2 inches in diameter, round and flat, with its edges broken a little on two opposite sides. This was the only specimen of a pebble that I saw in Florida, and I pronounced it a foreigner.

All of the marine shells which we saw at these South Florida shell-heaps corresponded with the live species now inhabiting the waters of that section. All of the stone implements or fragments, except the piece of soap-stone and quartz pebble before noted, corresponded with the limestone, or the lime fossil coral, or the silicified corals, &c., of that region, the latter, so far as I know, being found only in Hillsboro' Bay, and mostly at Ballast Point, about 5 miles below Tampa. In fact all of the arrow heads from South Florida that I have observed appear to have been made of material obtained at or near Ballast Point. Here are many silicified geodes, both large and small, some having an outer surface that shows a coral formation, while the inner surface is of various bright colors of chalcedony or drusy quartz. Here also are pieces of cherty flint of considerable size, which, when they have not been previously broken, are coated with limestone. The beach at low tide is literally covered with quartz that has been artificially broken. Many apparently unfinished implements are found, and also occasionally finished arrow heads, scrapers, &c. Arrow and spear heads were made from the thin flattish sides of geodes, so that the work was much more hazardous than making them from thicker stock. Cavities were numerous even in the best material found here, and presumably for that reason unfinished implements are very numerous in this vicinity. While in many places the beach abounds in stone, I have never known of any having been found, in nature, upon the inland surface.

A little back from the beach at Ballast Point is a long ridge of shells, much broken, as if washed up by the tide. There are, however (the facts before noted), plenty of evidences that this was ground formerly frequented by the Indians, and many believe this ridge of shells to be the remains of an Indian shell heap.

ANCIENT EARTH-WORKS IN CHINA.

By MARK WILLIAMS, *of Kalgan, China.*

From Kalgan to Yücho are ancient mounds in cluster on the plain or singly on eminences. These latter would indicate signal towers, while the former would suggest tombs. They are about 30 feet high, circular and oval in shape, and no arrangement can be observed in the clusters.

At the base of a signal mound by the great wall of Kalgan I found a stone ax.

The Chinese give no rational explanation of these mounds. I have as yet found no mention of them in ancient records. At Yücho, 100 miles south of Kalgan, is a cluster of forty mounds; 4 miles off are ruins of a city wall. Chinese cities have rectangular walls, with towers at short intervals. But this is a circular embankment with no remains of towers. The part of the remaining entrance is unlike the gate of a Chinese city. Records state that this was the seat of a Chinese prince who lived B. C. 200. In some places the wall is levelled, in other places it is perfect, making an acute angle at the summit. Cultivation has narrowed the bases of the mounds, but superstition prevents their destruction. To one familiar with the works of the mound builders in the Mississippi Valley, the stone ax, the mounds, circular wall, suggest a similar race.

PLAN FOR AMERICAN ETHNOLOGICAL INVESTIGATION.

By the late HENRY R. SCHOOLCRAFT.

[The following programme, though never officially adopted by the Smithsonian Institution, embodies the result of much study of the subject by the distinguished author; and even after the lapse of forty years possesses sufficient interest and suggestiveness to justify its publication.]

> "*Plan for the investigation of American ethnology, to include the facts derived from other parts of the globe, and the eventual formation of a museum of antiquities and the peculiar fabrics of nations; and also the collection of a library of the philology of the world, manuscript and printed. Submitted to the Board of Regents of the Smithsonian Institution, at their first meeting, at Washington, in September,* 1846."

NEW YORK, *August* 22, 1846.

GENTLEMEN: In laying before you the following suggestions, I am governed by the opinion that there is a means of investigation of the subject proposed, which possesses general interest as a branch of human knowledge, and cannot but be invested with peculiar force to men of letters dwelling on the western continent. The origin, dispersion, and affinities of nations, and their transference from the eastern to the western hemisphere, prior to the period of Columbus, have constituted subjects of interesting inquiry from the time of the discovery. And viewed in the lights which are now presented by the progress of ethnography, modern geographical discovery, and other means of advancing the study of nations, the inquiry may be supposed to be one which the mind of Mr. Smithson had embraced in his enlarged conception of promoting "the increase and diffusion of knowledge among men."

The occupation of the continent itself by men diverse—in their physical and mental traits and their languages, from the various races of its discoverers at and after 1492; separated as that continent is, by seas and open straits, from other parts of the globe, constitutes an interesting and unsolved problem. And its solution is still more interesting when we reflect that these native races had no maritime skill adequate to the construction of ships; that the state of arts, if we make some local exceptions, was very low; that they were without letters or literature; and, when questioned as to their origin, they put forth traditions which were generally better suited to engage the imagination than to satisfy the judgment.

The extent and noble proportions of the continent, stretching for thousands of miles along the Atlantic, and forming a vast and mountainous barrier between it and the Pacific, entitled it in more than one sense to the appellation it received by every succeeding navigator of the New World. It was indeed a new world, not less in its grand physical structure than for the races of man, who roved over rather than inhabited it. And these latter races, now that 354 years have passed, are quite as much a problem to historians and philosophers, in respect to their early connection and national affinities with the races of Asia, Africa, and Europe, as they were then.

But when we examine this continent in all its sweeping latitudes and longitudes, in its highest altitudes, and in its lowest and broadest valleys, we find imbedded in its very geological strata, as well as in its surface, ruins and other evidences that it had been inhabited long anterior to the Indian race,—that there had been people of diverse arts and habits upon its plains and estuaries. And that, of the red race itself, there are evidences of mutations and changes, reaching from mere sachemships to rude colossal empires, which, like that of Montezuma, broke down, in fact, under the glittering and disproportioned weight of their inherent corruptions and barbarisms.

Forts, mounds, ditches, and works of art, pottery with the triune emblem of the philosophy of Zoroaster, mummies wrapped in their half Nilotic cerements, vast pyramidal structures of earth and of stone, palaces and ruined cities, are among the objects of its antiquarian and historical interest. Not only from the romantic and sublime lake of Titicaca, and the fire-crowned peaks of the valley of Mexico, do we perceive centers of population, rushing out to rule and conquer, but from the yet unexplored plains of the Rio Gila and the Colorado of California, from the broad valley of the Mississippi, from the southern slopes of the Appalachian range of the South Atlantic, and even from the colder latitudes of the Great Lakes, where the indomitable Iroquois built up their republic, we behold a concurring series of facts and discoveries which prove incontestably that various races of the wide-spread and original family of man have lived, and cultivated, and warred, and died at these localities.

When we come to apply to these vestiges of ancient structure the scrutiny of exact observation and description, and to view the facts under the lights of induction and historical analysis, we elicit several classes of evidence which tend to restore important links in the history of the original dispersion of our species, advance us in the scale of knowledge, and go far to enable us to appreciate and understand our position on the globe. And in proportion as this investigation is pressed, in proportion as science is applied to it, and the current of investigation deepened, we abstract from the boundaries of mystery and conjecture, and add to these of ascertained facts and history. We thus progress indeed in knowledge, and compass one of the noblest ends of being.

It is in this light that ethnology makes its appeal to modern letters; and I beg leave to bring its claim to your early consideration. It is proposed to consider ethnology in the most enlarged sense of which the etymology of the word admits as embracing man in his divisions into nations; their affinities and characteristics, mental and physical, with such proofs deduced from history, philology, antiquities, and the exact sciences, as may serve to link nation to nation, and race to race. In this study particular reference is designed to be had to the position of the American continent, and to the aboriginal races found upon it, when first discovered by Europeans. In this view, it will embrace not only geography, antiquities, and history, as descriptive sciences, but likewise the early history of arts, ethnography, comparative philology, geology, and physiology, and such other collateral sciences as may be found necessary to investigate, illustrate, and explain the subject.

The mode of advancing the subject, and carrying into effect the inquiry, so as best to bring out the facts for general information, may admit of some diversity of opinion. It is not an inquiry which admits of extempore results. To consider diligently the various parts of the continent which furnish aliment for the investigation, to scrutinize and collate what has been discovered and written, to collect from mounds and other sources, in various parts of the world, specimens of ancient art, and above all to embody the present and past philology of tribes and nations, is a labor requiring time and attention. Much of this, when acquired, is hardly of a character to sustain popular lectures. It may be doubted, indeed, whether in offering researches in a verbal form they are not always in danger of suffering from the hands of theory and rhetoric. Still, it is a question whether condensed statements of parts of the inquiry may not thus occasionally be thrown out. But whether so or not, the inquiries should be printed at a press owned and controlled by the board, and in a form to correspond with the general style and plan of their publications. In what manner compensations should be awarded, and whether by a temporary appointment or a fixed professorship, having a residence at the parent Institution, and the benefit of its library and collections, in the various departments, may admit of consideration. One remark may however be confidently added, that without adequate provision for the time, books, and travel incident to the inquiry, no person can be expected to enter upon effective labor in this field.

Outlines of the study are sketched in the following synopsis.

(I.) OBJECTS OF INQUIRY.

1. *Physical type of man, or physiological traits by which the several races of men may be distinguished.*

(*a*) *Ethnographical position on the globe.*—Tribes; nations. (*Wiseman.*) Generic groups. (*Blumenbach, Pritchard.*)

2. *Material existence.*

(*a*) *Means of subsistence.*—In the hunter state: (Zea maize, roots and fruits, flesh of animals;) Ichthyophagi: (Coast-tribes, crustaceans, fish. What species?) Herdsmen: (Gens des roche, gens des large.) Agriculturists: (What plants cultivated? how? and by whom? what agricultural tools? Cotton-plant; tobacco; potato.) Concurrent facts in natural history.

(*b*) *Mechanical arts: skill.*—Clothing: skins: bark: hemp-plant; hunting implements; arms; implements of public games; fishing implements: nets: fish-hooks: bone-needles; navigation; vessels: native cordage; utensils for preparing food: knives: pots; potter's art: What condition? vessels of clay—raised by hand or on the wheel? boiling. How effected, where no clay pots? Metallurgy. What facts? Axe of stone, of copper. Trees, how felled? baskets: twine: awls, of bone or horn; pipes of clay, of stone; art of dyeing.

(*c*) *Architecture.*—Dwellings, how made; tools in reference thereto; sculpture; painting; monuments of stone, of earth; temples; roads; bridges; teocalli; mounds; idols; baths; fountains; sepulchres.

(3) *Intellectual existence.*

(*a*) *Languages spoken and written.*

(*b*) *Geographical names.*

(*c*) *Picture writing.*—Hieroglyphics; wampum belts; quippus; inscriptions.

(*d*) *Arithmetic.*—Units: mode and limits of computation; decimal system; vigesimal mode; high numbers, how denoted.

(*e*) *Measure and division of time.*—Day, month, year; astronomical facts; chronology, how denoted; measure of length; capacity; value, (currency.)

(*f*) *Social state and government.*—Civil institutions; political phenomena; laws, penal and civil; marriage; distinctions of rank; castes; clans, chieftainships; descent of titles and rights; totemic principle, how extensive; condition of females; marital rights to property.

(*g*) *Religious belief and institutions.*—Ideas of the Deity; priesthood, how organized; prophets; jossakeeds; metas; nature of worships; fire worship, how spread; demonology; guardian spirits; compensations for *sin;* sacrifices; feasting; fasting; dreams; dancing.

(*h*) *Music and poetry.*—Musical instruments; music boards; mnemonic songs, by symbolic annotation; rhymes, any; war chants; pictorial rolls and devices.

(*i*) *Oral tales and legends.*—Historical fictions; allegories; fables; tales of amusement; concurrent proofs of imagination (*Algic researches*).

(*k*) *Medical knowledge.*—Lancet; cupping; pathology of diseases; magic, as applied to medicine and hunting; botanical remedies; metallic; knowledge of anatomy, what; theory of the circulation of the blood.

(*l*) *Mythology.*—Persian; Egyptian; Chinese; Grecian (*Bryant*); Roman; American.

(*m*) *Philosophy of life, death, and immortality.*—Ancient cosmogony; notions of creation; deluge; monster-era; transformations; metempsychosis; state of the dead; ghosts; witchcraft; idea of vampires.

(4) *Geographical phenomena as affecting or modifying the physical type and the material and intellectual existence.*

Climate; interior or seaboard position; natural productions, as affecting physical development; tropical and torrid zones; influence of the polar latitudes; meteorology and topography generally; effects of snow and ice on the physical type, as in the Eskimo.

(II) MEANS OF ASCERTAINING THE FACTS.

1. *Antiquities and existing monuments.*

(*a*) *Remains of art.*—Buildings; antique excavations; caves; tumuli; pyramids; teocalli; military works, ditches, moats, &c.; columns; arms; the arch, how developed; mechanical tools, of stone, lead, copper; the lever and wedge; idols; sarcophagi; mosaics; bricks, art of making, traced; pottery, how developed; gems and other ornaments; has glass ever been found in American ruins of the ancient period?

(*b*) *Proofs of mental development in the fine arts and composition.*—Laws of proportion in architecture; painting; statuary and sculpture; picture writing; hieroglyphics; phonetic signs; dawning of the alphabet; oral tales and traditionary lore; inscriptions.

2. *Existing intellectual evidences of generic groups.*

(*a*) In vocabularies; (*b*) dictionaries; (*c*) grammars; (*d*) plan of utterance; (*e*) names of places. (Antique.)

3. *Physiology.*

(*a*) Skulls; (*b*) mummies; (*c*) osteological remains.

4. *Historical relations and works.*

(*a*) Works ascribed to natives, as in Mexico; (*b*) works by Europeans; (*c*) missionary translations, &c., modern period; (*d*) authentic traditions of all ages and countries. (Recorded.)

5. *Natural History.*

(*a*) Changes the earth and animated nature have undergone, as denoted by embedded bones; (*b*) what effects have taken place in the superincumbent formations since the existence of mammalia; (*c*) how deep in the geological column can the existence of man be traced; (*d*) general reflex character of geology on the topic.

6. *Mythology, as a proof of mental affiliation in remote and barbarous races.*

In reference to all the objects, it is essential to compare the several American nations one with another, and with the leading nations of other parts of the globe. In proceeding to explore the subject, the first labor must be that of accumulating facts. Visits to the several objects of antiquarian interest demanding attention, with proper instruments for observation, are required. Field surveys of ruins, and drawings of all important objects to be commented on, are essential. Care must be taken to notice whether there be more than one era of occupancy, or one type of nationality, denoted by the same locality. And with the same view the different ages and relative position of the different geological formations, embracing ruins, or objects of art, should be carefully noted. Fossil bones of extinct or ancient species of animals, and beds or banks of shells of the Eocene or Pliocene deposits, furnish the character of evidence denoting separate epochs of occupancy, and become invested with new interest. Traces of organic life of the higher species have been found deeper down in the geological column, in later days, than were known to the elder geologists, and the vestiges of man should be carefully sought in all the unconsolidated strata. We know the globe has been disturbed since its creation and destruction, and we should be prepared to find physical evidences of it. Not only architecture, but metallurgy, pottery, sculpture, and drawing should be interrogated, in examining their remains, on American soil. Inscriptions on rocks are of value, as antiquarian proofs, as well as all traces of the ancient method of symbol or picture writing.

But whatever degree of care is evinced by personal inspection, it is essential to the purposes of comparison that a full and complete collection of antiquarian objects, and the characteristic fabrics of nations, existing and ancient, should be formed and deposited in the Institution. By adding to this, from time to time, such implements of art or war, articles of costume, or other objects of curiosity, as might be obtained, there would be formed, in the end, a museum of mankind, wherein each tribe and nation would be characteristically represented. Such a museum would, in itself, be a desideratum.*

Nothing is more characteristic of the intellectual existence of man than language. It is found to be a more enduring monument of ancient affinities than the physical type, and there is no tribe however situated from whom this proof of affiliation should not be obtained. By collecting a vocabulary and grammar of every known tongue, from printed and verbal sources, the Institution would present to the world a library of philology which would cause its site to be resorted to from the remotest quarters. In the United States and British North America alone we have at least sixty-four dialects and languages.† Nor should the mythology of rude nations be neglected. It is the frame-work of their philosophy and their religion, and gives character to their songs and poetry and every form of intellectual excitement.

Finally, both the duty of observation in the field, and the examination of facts and evidences in the cabinet or library, may be commenced immediately, and need not be delayed until the contemplated buildings are completed, and other parts of the library, &c., perfected. Time is essential in making preliminary examinations. The consideration of the country may be taken up in a separate and systematic manner, taking valley by valley, or State by State. Some portions of the land are more prominent in their claims to notice than others; but in all over which the tide of modern emigration sets, the evidences of its former occupation are rapidly disappearing. The same may be said of the Red Race, whose language and customs it is wished to preserve. The earlier the labor is done, the more easy will be its execution. In the Mississippi Valley alone, where so many evidences of the earliest and heaviest ancient population exist, but a few years will place the most important facts beyond our reach. By adopting the plan suggested, or some plan of this nature, we shall rescue from the oblivion of past generations matter for thought and reflection for the future. As fast as the information is collected, digested, and prepared, it can be submitted to the public. Whatever form for diffusing it the Board may through its committees adopt can be conformed to; and in this way the object may at once be made to assume a practical cast.

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* Many valuable objects of this kind have been brought home by the exploring expedition, and are now deposited in the Patent Office.

† Gallatin, Am. Ant. Col., Vol. 2.

In submitting this plan, which has been hastily sketched, and expressing at the same time the interest he feels personally therein, the undersigned begs leave to subscribe himself,

With high respect, gentlemen, your obedient servant,

HENRY R. SCHOOLCRAFT.

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MISCELLANEOUS PAPERS

RELATING TO

ANTHROPOLOGY.

FROM THE SMITHSONIAN REPORT FOR 1886-'87.

WASHINGTON:
SMITHSONIAN INSTITUTION.
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O. T. Mason
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MISCELLANEOUS ANTHROPOLOGICAL PAPERS.

AN INDIAN MUMMY.

By James Lisle, *Long Pine, Nebraska.*

West of Fort Casper, in central Wyoming, is Poison Spider Creek, a tributary of the North Platte River. The valley of this stream is bounded on the northwest and north by a ridge of sand-rock, forming the water-shed.

In places this rises precipitously to the height of 40 to 50 feet, with a width at the top of 100 to 300 feet. Elsewhere the rock barely shows at the surface. In a cave in the west face of one of these precipices was found by S. D. Helm and D. W. Moffatt, the mummified body of an Indian. The cave is open to the weather—a mere recess about 14 feet long, 7 feet high, and 8 feet deep. Inside this is a second cave or recess, the floor of which is about 2½ feet above the main floor. This recess is about 7 feet long, 4 feet high, and 4 feet deep. The whole opening is natural.

The body, evidently that of some important personage, was placed in the inner cave in a kneeling posture, quite erect, with a very slight bend at the hip-joints to balance. The head is thrown well back, the chin high, and both head and face turned a little to the right. The hands are joined across the bowels, the right hand outermost. The face was to the front, looking westward. Originally there must have been some kind of stay or prop to support the body in its position, but this had long since disappeared, and the body had fallen to the left, the limbs and feet being slightly twisted in consequence.

The clothing was entirely rotted away, except fragments under the bracelets; the bits remaining here are of cotton. A leather belt, much decayed, is around the loins. Around each wrist is a coil of brass wire, forming a bracelet. That on the left wrist makes forty to fifty turns and extends about 6 inches. On the right wrist the coil is about 2 inches shorter. On the fingers are several coarse brass rings. In the ears are rings made of brass wire, the metal being very much corroded.

Around the neck is a necklace or collar made of pieces of quills cut from the wing-feathers of some large bird. The pieces are about an inch long, and the size about that of the wing-quills of a chicken. There is no pattern proper. The pieces extend lengthwise of the collar, about ten of them being placed side by side, making the width of the collar, about 2½ inches. Underneath this collar is another of similar workmanship considerably decayed. No weapons were found save pieces of nine or ten arrows, some with metal points, the others pointed with flint. Fragments of a bridle and saddle were found, the leathered work reduced to dust. The bridle-bit was a very primitive affair, but apparently made by a white man. The saddle was of Indian workmanship—a sort of "tree" made of bones. The man was of middle height and fifty to fifty-five years of age at his death. His hair, which is about 15 inches long, is slightly streaked with gray in front. He evidently died of an acute disease, since there is no sign of wasting sickness nor of bodily injury. The body was not embalmed nor was any special effort made to preserve it. The brain and internal organs have not been touched, the preservation of the body being due to the climate, aided to some extent possibly by chemical agencies within the cave itself (in places in the reef near by, the rocks are impregnated with petroleum, etc.). The flesh has dried up and shrunken to the bones. The weight of the body is about 25 pounds.

6

MOUND IN JEFFERSON COUNTY, TENNESSEE.

By Dr. J. C. McCormick, *Strawberry Plains, Tennessee.*

The mound of which this paper is the subject is on the left or east bank of the Tennessee River (Holston) 4 miles north from Strawberry Plains, Jefferson County, Tennessee. It is much larger than any other in this valley. It is about 30 yards from the river's bank, and its remarkable size and well-defined contour is such as will attract the attention of the most casual observer. Flints, broken stone, shells, and pieces of broken pottery all attest that it is the work of the mound-builders. The river at this point follows a course south 20 degrees east. No ditches or signs indicating that this mound was used as a place of defense are visible. Had these formerly existed the continued cultivation of the land for so great a period would most assuredly have obliterated them.

The mound is circular in outline, and is, properly speaking, an earthen burial mound. No stones of any size or in any considerable number were used in its construction. In the immediate vicinity are the remains of broken bowlders, but they do not occur in great numbers, neither do they enter into the "make-up" of the mound. In outline the mound is nearly a perfect circle. Measured from the base on one side to a corresponding point on the opposite side, on a horizontal plane, it is 120 feet in diameter. Its present diameter is somewhat greater than when completed. This is easily explained when we take into consideration the repeated plowings it has from time to time received for a century. Aside from this, the wearing and washing away produced by natural causes were sufficient to increase its natural diameter to a slight extent, while its perpendicular height has been greatly reduced. Its present height is 12 feet.

On Tuesday, November 2, 1886, I began an exploration of the mound. A trench was dug on a level 3 feet above the bottom of the mound. This trench extended in a direction north and south through the mound and was about 5 feet wide. Another trench of like dimensions and on the same level was begun on the west, and carried forward to a point where it intersected the trench running north and south. At a point near the junction of these, and 3 feet below the surface, was found the first skeleton. It had been buried with the head toward the east; had evidently been placed upon its right side, the face toward the north. The thigh bones were to some extent flexed upon the body, and the arms had been placed in front of the body and were somewhat extended. The cranium, teeth, tarsal, and metatarsal, carpal and metacarpal bones were in a fair state of preservation. No relics were found with this individual. Further exploration led to the discovery of five other skeletons during the day. These were found with their heads towards the east. Beads were found, and from their position it is evident they had been worn around the neck. During the day a skeleton was discovered near the apex of the angle formed by the south and west trenches.

On the second day the first skeleton observed was that of a child, evidently less than two years old. It had not passed the period of first dentition. The cranium was broken down and decayed to such an extent as to render any measurement of it utterly impossible. Of the long bones, the following linear measurements were taken at the time: Femur, 8.12 inches; tibias, 6.62 inches; humerus, 6 inches; radius, 4.55 inches. The others were in a very bad state of preservation and accurate measurement was impossible. Another skeleton, that of a large sized individual, presented some interesting peculiarities. The skull of this skeleton was the first part met with in the process of unearthing. The bones of the cranium were in a fair state of preservation, as were those comprising the vertebral column and those of the upper extremity. The pelvic bones, also, were almost entire; but on searching for the bone of the thigh I was somewhat surprised when, after a careful search, only a small portion of the right femur was discovered. The remaining bones of both the lower limbs were entirely missing. That portion of the right femur exhumed presented all the characteristic signs of diseased bone, and the individual to whom it belonged had evidently been the subject of necrosis. It is not unfair, neither is it unreasonable, to assert that this disease prevailed among the mound builders as well as among races of mankind at the present day. But what was most perplexing was the absence of the other bones belonging to the lower extremities.

Of the remaining fifteen skeletons that were removed from the mound during the three days of my exploration, there was not one that presented this peculiarity. In *all* of them the bones of the lower extremities, or at least some portions, were found. Six skeletons were taken from the mound during the second day. Among this number were several in which some of the bones were in a good state of preservation. One of these gave the following measurements: Cranium, vertical height inside, 4.90 inches; occipito-frontal arch, 13.50 inches; parietal diameter, 6 inches; horizontal circumference, 20 inches; length, 7 inches; length of femur, 18.50 inches; length of tibias, 15 inches; tibial circumference in middle, 3.75 inches; tibias, least circumference, 3.25 inches; humerus, 12.85 inches; radius, 10.12 inches; clavicle, 6.25 inches.

Four skeletons were found during the third day. My assistant while removing one of them found a pipe and gorget that had been placed in front of it. The gorget is a circular disk 4 inches in diameter. It is made from a large and heavy shell. Both sides have been smoothly dressed, but are now somewhat roughened and stained, no doubt by the action of the soil in which it has lain. There are two perforations near the margin of the disk. They are considerably worn, thus indicating its long-continued use. The convex surface is plain and presents nothing for examination worthy of mention. The lines are well defined, and are clearly and deeply cut. The design is no doubt intended to represent a bird; in fact, the profile is plainly to be seen. Its resemblance to the cedar bird, *Ampelis cedrorum*, is very marked. The eye is represented by a small circlet; within this there is a small depression or pit that is intended to represent the iris. The mandibles are short and conical in outline. A pointed crest that arises from the back of the head is plainly discernible. The incisions are clearly and cleanly traced, and the entire design exhibits the skill of the mound builder artist in a remarkable degree.

Among the objects obtained from the mound were several hundred beads of various sizes. The greater number of these are made of shell; some are of bone. Many are in a good state of preservation. Several flints were found that had apparently never been used, as their sharp edges and points would seem to indicate. Three whole vessels were taken from the mound. Several small disks of shell were found; these presented no particular ornamentation that is worth mentioning. Two pipes were recovered; these were uninjured and are without ornamentation. Three implements of bone are smoothly and evenly finished. They are hollow throughout their entire length. They are bevelled on one side for about half their length, and near the circular end there is a perforation on one side extending to the cavity within. They are no doubt made from the tibias of some animal, perhaps that of a deer. In addition to those already mentioned, there were found several pins, awls, and stones of various shapes and sizes.

In structure the mound consists of alternate layers of clay, sand, and ashes, varying in thickness, the material of which was probably obtained near by. The clay used in the construction of the mound was most likely taken from the river bank. Sand is found along the river. Stone was not used in the construction of this mound. Both land and fresh water shells are found scattered throughout its extent. The fresh water species largely predominate. Among them are found *Helix spinosa*, *H. alternata*, *H. appressa*, *H. elevata*, *Campeloma ponderosa*, *C. decisa*, *Io spinosa* (the latter abundant), *Angetrema verrucosa*, *Pleurocera anthonyi*, *P. filum*, *Anculosa prærosa*, *Unio verrucosus*, besides many others which I am unable to determine.

Sixteen skeletons were taken from the mound. Of the crania, several were saved in fair condition. The bodies were usually interred with the heads to the east. In almost all cases, the limbs were flexed. Two skeletons I found had evidently been buried in a sitting position. In these the lower limbs had been flexed so that the knees were drawn up nearly as high as and in front of the chin. The bodies had been placed on a layer of soil; above this was a layer of sand, and above the sand a layer of ashes. Very few pieces of charcoal were observed, and it is fair to suppose from this that cremation had not been practiced here. Aside from this there were no bones found that showed any evidence of the action of the fire. In the northern half of the mound I discovered what had formerly been posts or timbers placed on end. These were very much decayed; upon close examination they proved to be of black walnut, *Juglans nigra*, which is common in this locality. They did not occupy a perpendicular position, but had been placed about 12 feet apart at an angle of perhaps 60 degrees to the north. I examined carefully around these for anything that might have been placed there, but nothing was found. I very much regret that inclement weather and other unavoidable circumstances prevented any further investigation of the mound at that time. At some time in the near future I hope to resume the work of a more thorough and minute examination of the mound and its contents.

ANCIENT MOUNDS AND EARTH-WORKS IN FLOYD AND CERRO GORDO COUNTIES, IOWA.

By Clement L. Webster, *Charles City, Iowa.*

Floyd and Cerro Gordo Counties, in the northern central portion of Iowa, are among the most fertile portions of the State. The region is watered mainly by the Shellrock and Cedar Rivers and their tributaries. The surface of the country is a gently undulating prairie with only narrow belts of timber along the streams and a few isolated groves or "patches of timber" adjacent to them.

The west side of the valley of the Shellrock and Lime Creek sometimes rises to a height of from 70 to 123 feet above the water in the stream, thus affording a beautiful and extensive view of the surrounding country. The soil of the entire region is a rich deep black loam, mostly of drift deposit, easily cultivated, and remarkably well suited to the production of the cereals. When first settled by the white man much less timber occupied the surface than now.

In early times this region, especially the Shellrock and Cedar valleys, was the seat of populous settlements of the red men; but not so (except in the Cedar valley), of the mound-builders, the remains of which are mostly their burial mounds and earth-works.

On the south bank of Lime Creek, at Hackberry, Cerro Gordo County, a small mound is located. This mound occupies a position on the edge of a bluff, which at this place rises abruptly to a height of 70 feet above the water in the stream, and commands a beautiful and extensive view of the region to the north, northwest, and east. By the caving away of portions of this bluff about two thirds of this mound has been destroyed; but, judging from the portion which still remains, it must have been, originally, about 15 feet in diameter, and from 1½ to 2 feet in height, circular at the base, and with a gently rounded top. Excavations revealed a horizontal layer of broken pottery, the fragments almost always lying with the concave side upward. The surface of the pottery had been ornamented by rude impressions, and had been broken before being placed in the mound. This pottery occupied a position slightly below the natural surface of the ground around the mound. Associated with the pottery were numerous flint arrow-points (finished and unfinished), of various designs. In the extreme southeast portion of the mound, and occupying a position a few inches above the layer of broken pottery, were several plates from the lower portion of the carapace of a turtle. It is possible that these plates may have gained this position long subsequent to the formation of the mound. No human bones, or other relics than those mentioned, were found.

About the center of the southeast quarter of section 5, township 95, range 17 north, and half a mile west from Flood Creek, in the western part of Floyd County, a peculiar mound is located. The topography of the country immediately adjoining this creek, in this region, is rather low and level, but not usually wet. This mound is situated on the margin of a belt of timber, bordering a low, wet depression of the general surface of the land. It was about 16 feet in diameter, and 1 foot high at the center, with a circular basilar outline and flat top, except a rounded ridge 8 or 10 inches high and 1 foot wide at the base, which occupied the outer edge of the surface area. All round the base was a trench, about 10 inches deep and 1 foot wide, from which earth had no doubt been taken to form the ridge, and, in part, the mound itself. The surface of the mound was densely covered by poplars (*Populus tremuloides*), wild plum (*Prunus americana*), and hazel brush (*Cœylus americana*).

Mr. Merton T. Webster and the writer together made a partial exploration of this mound by extending an excavation part of the way through it, 2 feet wide and 1½ feet in depth, with the following result: First there was a layer of decomposed plant remains and earth, and then a layer of charcoal, then a bed of ashes, and afterwards a layer of soil. Below this layer of soil was another bed of charcoal and ashes, occupying the same position relative to each other as those above. This bed of ashes rested directly upon the natural surface of the ground, which did not show any particular evidence of strong heat.

This description may be illustrated by the following cut, Fig. 1:

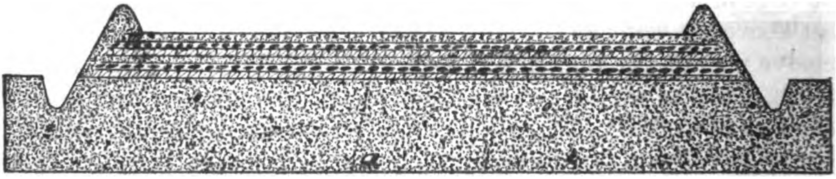

FIG. 1.—Section of ancient mound near Flood Creek, Floyd County, Iowa.

A careful examination of the charcoal, which was mostly in large pieces and finely preserved, convinced us that the fuel had been largely poplar wood. No burned bones or remains of artificial objects were found.

In the eastern part of Floyd County, near Charles City, a large and very interesting group of ancient mounds occur, most of which have been explored by the writer.

All these mounds, thirty-one in number, are located, with one exception*, two miles northwest from Charles City, near the center of section 26†, township 96, range 16.

These mounds occur (except the three isolated ones) in a nearly straight line, running about 20 degrees west of north, on the summit of a low, broad ridge.

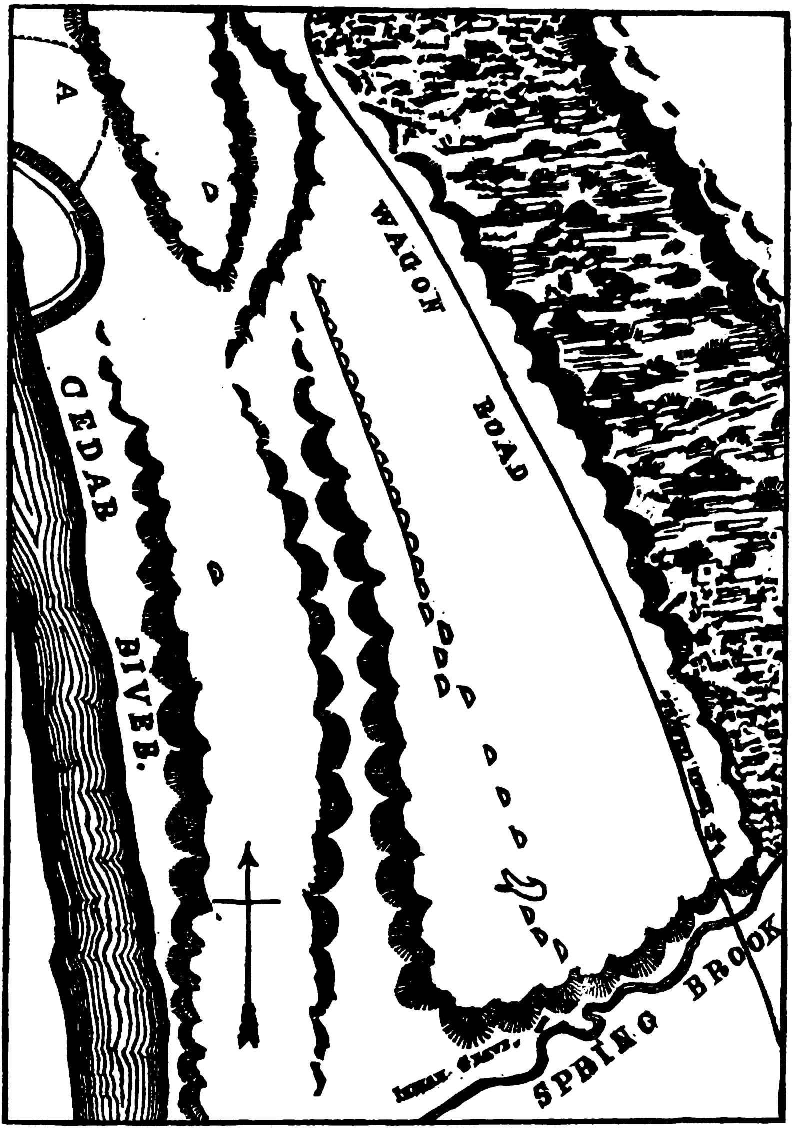

FIG. 2.—Map, showing location of Mounds.

By referring to the accompanying map it will be seen that a spring brook flows past the south end of this line of mounds, and the Cedar River about half a mile to the west; while a quarter of a mile to the east is located a slough, and a longitudinal depression occurs at the base of the ridge on the west.

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*This "exceptional" mound is located near the center of the southwest quarter of section 23. Section 23 joins sections 26 on the north.

† Nearly all this land is now owned by Mr. John Scringer.

These mounds are in reality situated in the valley of the Cedar River, the true valley side being from half to three-fourths of a mile to the east.

This entire ridge was originally covered with a heavy growth of oaks, poplars, etc.; but most of it has long since been cleared away in the opening up of the land for cultivation.

Mound No. 1 (counting from the south end of the line), 63 feet in length, and 48 feet in width, and 3 feet in height. This appears to have been a natural elevation to which dirt has been brought and so completed the mound. This was partially explored, but nothing found. Seventy-five feet to the west from No. 1 is a circular mound 21 feet in diameter and 1½ feet in height. Unexplored.

Fifteen feet northwest from the last is another circular unexplored mound, 20 feet in width and 2 feet in height.

Ten feet from No. 3 is a large curved mound 163 feet in length (following the outer basal curvature), and varying from 20 to 25 feet in width and from 2½ to 3 feet in height. This mound tapers, and decreases in height toward the northwest, where, at the extremity, it has a height of 1½ feet and a width of 8 feet.

Not far from the northwest extremity of this mound occurs a spur or extension of the main mound. This spur is 27 feet long, and quite rapidly diminishes in height and width (especially in height), until at the end it is less than 1 foot high and only 10 feet in width. This appears to have been an original mound with additions made to it by human hands. Excavations were made in this mound at different points down to the level of the ground at the base of the mound, but without finding anything.

The north part of this mound is still covered with hazel brush, while the south part has been plowed over for many years.

This mound, as well as mound No. 1, seems not to have been raised for sepulchral purposes, as nearly all others of the group have been.

No. 5, a circular mound, 300 feet from No 4, 1½ feet in height, 21 feet in diameter, and surface occupied by hazel brush. Unexplored.

No. 6, a mound 200 feet from the base of No. 5, circular, 1½ feet in height, and 21 feet in diameter. This has been degraded by the plow. Unexplored.

Between Nos. 5 and 6 there is another mound; but as there is some uncertainty regarding its origin, it is not represented on the map.

No. 7, a mound about the same in all respects as No. 6. Unexplored, degraded by the plow, and 100 feet or more from No. 6.

No. 8, a circular mound, 45 feet in diameter, 3 feet in height, and 50 feet distant from No. 7. Degraded and unexplored.

No. 9, a mound 10 feet distant from No. 8, is about 30 feet in diameter, and 2½ feet in height. An exploration of this mound was made by an excavation in the center, 8 feet square, and extending down to the level at the base. From 20 inches below the surface and downward fragments of pottery were found. Lying on the natural surface of the ground was found a closely packed bundle of human arm and leg bones, lying due east and west. On the east end of these bones reposed a crushed and somewhat separated cranium, some portions of which were very thick, and the teeth large and strong. The bones and skull were those of a young adult person. Two feet to the northeast from the first bundle of bones was another similar bundle, lying directed a few degrees south of east. On the east end of this bundle lay a portion of a crushed skull. The skull and bones were somewhat charred by fire, which appears to have been done after being placed in the mound. A few feet to the southeast from the last bundle of bones, was found another similar closely packed bundle, lying directed about 13 degrees south of east. No skull was found with this bundle. A few feet to the northwest from the first bundle of bones was found another like bundle, lying due east and west; no skull was present. Scattered through the mound were a few small pieces of charcoal, hard-burned clay, and pieces of limestone showing the action of fire. Some years ago an excavation was made in the center of this mound, and a skull, together with one or two bundles of bones, was taken out. All the bones in this mound showed more or less evidence of calcination. With one exception, all the remains had been elsewhere cremated before being placed in this mound. Formerly an oak tree, 12 inches in diameter, occupied the surface of the center of this mound, only the stump now remaining.

No. 10, a circular mound, 36 feet in diameter and 3 feet in height, and 12 feet from No. 9. Degraded by the plow. An examination of this mound was made, but without finding anything.

No. 11, a mound 4 feet from No. 10, circular, 45 feet in diameter and 2¼ feet in height. Degraded. An excavation 8 feet square and 2¼ feet in depth was made in the center of this mound. Ten inches below the surface and slightly east of the center a piece of broken pottery and a few small fragments of charcoal alone were found. No evidence of fire was observed save the charcoal, which appears to have been brought in.

No. 12 is similar to No. 11, but slightly smaller, and 12 feet distant from it. A partial exploration of this mound was made, and numerous pieces of hard-burned clay were found scattered through it, all of which had been brought in. Ten inches below the surface of the mound a portion of a calcined femur was found. No trace of fire was noticed in the mound.

No. 13, a mound 15 feet from No. 12, circular, 45 feet in diameter and 2 feet high. Degraded and unexplored.

No. 14, a mound 16 feet from No. 13, circular, 51 feet wide and 1½ feet high. In the center of the mound and 10 inches below the surface, a peculiar, imperfect skull, apparently that of a dog, was found, facing the southwest. Near this skull, and 7 inches below, were found quite closely associated five bundles of leg and arm bones similar to those found in other mounds of this series already described. In three cases a skull (crushed) had been placed on the west end of the bundles of bones, and in one instance a skull had been placed between two of these bundles. Underneath the west end of the north bundle was one-half of a lower jaw still retaining the teeth. The skull between the bundles had been placed on its right side, with mouth wide open, facing the northwest; scattered in the soil near it were numbers of its teeth, indicating that they had dropped out before being covered with earth. All the bundles of bones lay directed in an east, northeast, or southeast direction, none of them outside of the radius of the rising sun at some period of the year. In all but two instances the bones occupied a horizontal position; but in two cases they sloped upward in an easterly direction at an angle of several degrees. Seven inches below the dog skull, numerous pieces of ribs and other small bones were found, which had been thrown in promiscuously. All the skulls were rather thick, jaws and teeth large and strong. Some of the bones were those of very old individuals, while the majority were those of young adult persons. Associated with the human remains, and scattered through the mound, were numerous pieces of burned clay and charcoal which had been brought in. This charcoal was of oak of the same species as now grows in the region. Six inches below the surface of the mound two large slabs of water-worn (Devonian) limestone were found. These were obtained from the Cedar River, near by.

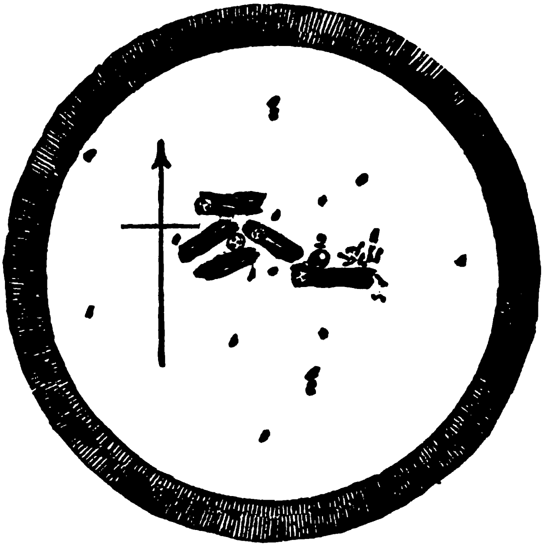

FIG. 3.—Diagram of mound No. 14. Human bones and crania. (1) Scattered fragments of rib and other small bones; (2) skull of a dog 10 inches below the surface of the mound; (3) scattered fragments of charcoal and burned clay.

The human remains had all been cremated before being placed in the mound.

The accompanying diagram (Fig. 3) will illustrate this description, as well as show the general method of interment practiced here by these ancient people.

No. 15, a mound 10 feet from No. 14, circular, 30 feet in diameter and 1¾ feet in height. A partial exploration of this mound failed to show any indications of fire or to yield relics of any kind.

No. 16, 16 feet from No. 15, is another mound of the same character. A partial exploration of this mound revealed the presence of human leg and arm bones, 17 inches below the surface of the mound, apparently thrown in promiscuously. No trace of fire or other relics than those mentioned were found.

No. 17, a mound 3 feet from No. 16, circular, 1½ feet in height, and 25 feet in diameter. An oak stump 8 or 10 inches in diameter still occupied a position on the edge of this mound. Degraded and unexplored.

No. 18, a mound 20 feet from No. 17, circular, 42 feet in diameter and 2½ feet in height. A trench 2 feet wide and 2½ feet deep was made through the center of this mound from east to west, but no trace of fire or relics of any kind was found. The material of the mound was homogeneous throughout. Degraded by cultivation.

No. 19, a mound 20 feet distant from No. 18, circular, 42 feet in diameter and 2½ feet in height. Occupying the surface of the mound was some hazel brush, and growing on the edge was a burr-oak tree 1 foot in diameter. Near the center of the mound three large oaks had recently been grubbed up; on the stump of one was counted sixty-three annual rings. In the center of this mound an excavation 8 feet square and 2½ feet deep was made. Lying at length, on a level with the ground around the mound, a skeleton of an adult person was found. This skeleton lay with the head 11 degrees south of east. The body had been placed on its back, head lying on its left side, mouth open about 1 inch, left shoulder drawn up and chin resting on the clavicle, and arms at the side. The cranium was large and well formed, the jaws and teeth strong and rather large, and judging from the worn condition of the crowns of the teeth, it was that of a person somewhat advanced in years. This skeleton indicated a person over 6 feet in height. As this skeleton, together with others, was stolen soon after being exhumed, it has made it impossible to give cranial measurements here as was desired. All the bones were in a poor state of preservation. No trace of fire was observed in the mound, or relics of any description found with the bones. The earth around and for 1½ feet above the body had been tamped very hard.

No. 20, 21 feet from No. 19, was another mound of the same form and dimensions, and covered with a growth of hazel brush, the young oaks and poplars which but a few years ago occupied it having been cut down and removed. An exploration of this mound was made with the following result: In the center of the mound, and 26 inches below the surface, was found three bundles of leg and arm bones, five skulls in a crushed condition, and what appeared to be two pelvis bones much decayed. In the center of this assemblage of bones was a small earthen vase or urn, set upright. Associated with and distributed in the earth above the bones were numerous pieces of charcoal, burned clay, and one or two pieces of broken pottery. The bundles of bones, with one exception, all lay in an easterly and westerly direction, while the skulls and other bones were placed here without apparent order. Most of the crania were those of young adult individuals, one of them a babe with milk teeth. Some of them however were those of very old persons, the crowns of the teeth (the teeth in all the skulls were very large) all having been worn down to and sometimes deeply into the dentine. The urn, which was of the rudest form the writer has ever seen from any mound, was nearly perfect. The bones, which were all in a poor state of preservation, were more or less calcined, some before and some after having been placed in the mound. The charcoal (one piece found was 21 inches in length and 4 inches in diameter) was of oak, and of the same species as now abundantly occupies the region and the surface of some of the mounds. The soil above and around the bones had been packed very hard.

No. 21, a circular mound, about 30 feet in diameter and 2 feet in height, and 25 feet distant from No. 20. The surface of this mound was covered by small hazel brush, and until recently by a growth of young oaks and poplars. An exploration revealed a circular, oval mound of red burned clay, 1 foot in thickness at the center and about 10 feet in diameter, 1 foot below the surface of the rest of the mound. Near the center of the mound, and underneath the burned clay, were three bundles of bones, similar to those found in other mounds of this series. Two of the bundles lay directed 11 degrees east of south; the third bundle lay directed due northwest and southeast. On the north end of the two first bundles of bones reposed a crushed skull, and on the southeast end of the third bundle was also a crushed cranium. These bones were all very much charred by fire. Associated with these bundles of bones were large quantities of other human bones, almost entirely consumed by burning. In the black soil above the burned clay a few small pieces of oak charcoal were found. Neither charcoal nor ashes, bones nor other relics, were found in the burned clay. The following section (Fig. 2) will illustrate the above description:

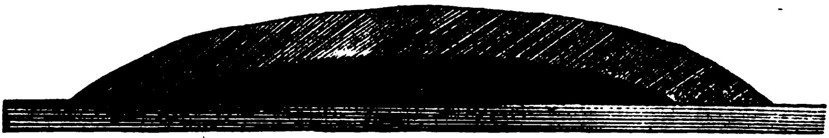

FIG. 4.—Diagram of mound No. 21. (1) Burned clay; (2) black homogeneous drift soil.

This mound appears to have been used not only as a burial mound, but as a cremation mound as well. It is known that the human remains found in the majority of the mounds of this group had been elsewhere cremated before being placed in the mounds.

No. 22, a mound of the same dimensions as the last, and 30 feet distant from it. Surface occupied by a few hazel brush and young oaks. Near the center, and 2 feet below the surface of the mound, a bundle of bones was found, together with a portion of a skull; all of which were in a much decayed condition. The bundle of bones lay due northeast and southwest. Distributed through the mound were pieces of oak charcoal and burned clay which had been brought in. There was no evidence that fire was used at this burial here. The soil around and for some inches above the bones had been beaten hard.

No. 23, 25 feet from No. 22, was a circular flattened mound, 30 feet in diameter and 1 foot high. The surface was occupied by hazel brush and a few small and medium-sized oak trees. A partial exploration of this mound was made, but no relics were found or evidence of fire observed.

No. 24, a mound, 25 feet from No. 23, circular, 45 feet in diameter and 1½ feet in height. Surface occupied by the same class of vegetation as the last. Three feet south of the center of the mound came upon a bundle of bones lying due east and west. Lying one on the east end and one on the west end of these bones, were two skulls. The skull occupying a position on the east end, lay on its left side facing south by southwest. Skull large, of moderate thickness, forehead low and sloping abruptly backward; teeth large and strong, and with crowns of molars and premolars worn smooth, indicating an old individual. As this skull soon crumbled in pieces on exposure to the atmosphere, definite measurements were not taken. The second skull was in a crushed condition, although a partial reconstruction of its parts was possible. Through the back part of the skull (left parietal bone) were three circular holes arranged in a line (the smaller one in the center), 5, 8, and 11 millimeters in diameter respectively. Whether these perforations were made by human hands or by the agency of some insect or its boring larva, after the burial of the bones and their softening by decay, we are unable to state. The latter supposition, however, seems to us the most probable.

No. 25, a circular mound, 45 feet wide, 3 feet high, and 20 feet distant from No. 24. Surface occupied by the same, but more dense, arboreal vegetation and undergrowth as occupies the surface of many of the other mounds. An exploration of this mound revealed nothing save a few scattered fragments of charcoal and burned clay, which had been brought in from some other locality. The material of the mound had been tramped hard.

No. 26, a mound about 53 feet distant from the last, circular, 33 feet in diameter, and 3 feet in height. Surface occupied by a few brush and the stumps of three oaks, one showing forty-eight and another sixty-one annual rings. Nothing was found in this mound except a few small pieces of charcoal of oak wood.

No. 27, a mound 5 feet from No. 26, and of the same form but somewhat smaller. Surface occupied by hazel brush. Unexplored.

No. 28, a mound 40 feet from the last, circular, 1 foot in height, and 24 feet in diameter. Surface partially occupied by small hazel brush and the stumps of a few small trees. Unexplored.

About one-third of a mile to the northwest from this line of mounds an isolated circular mound occurs. It is located on the brow of a somewhat higher and much narrower ridge, and about 40 rods from an abandoned portion of the channel of the Cedar, marked 1 on the map. This mound, we were informed by Mr. Capron, the present owner of the land, was originally about 1½ feet in height and 20 feet in diameter, but as it had been industriously plowed over for more than thirty-five years, its greatest height when examined by the writer was only about 6 inches.

A thorough exploration of this mound was made and with the following result: One foot below the surface of the mound, and 6 inches below the natural surface of the ground around the mound, was found a large quantity of broken pottery, charcoal, two sinkers, one rude arrow point, and a few flint chippings. All these relics showed evidence of having been burned after having been placed in the mound. One foot below the pottery, portions of a human skeleton were found. The bones (which appeared not to have been placed in a bundle) were too few and too badly decayed to allow of any definite knowledge as to the original placing of the body. A portion of the pottery found here presents a combination of net or basket markings and of separate cord markings. The regularity of the impressions upon the subglobular bodies indicates almost unbroken contact with the interior surface of the woven vessel. The rims have been ornamented by separately impressing coarse twisted cords. The rims of two of the vessels were ornamented exactly like the "Ancient British Vase" figured on page 399 of the Third Annual Report of the Bureau of Ethnology, except that the three upper and the three lower parallel lines are wanting.

Some of the vessels were smooth; all of a very moderate thickness, of a yellowish-red color, and made of pounded granite of drift origin, fine gravel, and clay. Portions of six vessels were found, and all, with one exception, having the rim variously molded and artistically decorated by the impressions of coarse twisted cords. One of the largest vessels, which was less fractured than the rest, and which admitted of a partial reconstruction of its parts, had an aperture diameter of 20½ centimeters, and a diameter of the large and abruptly flaring portion near the base of 31, and a height of 16 centimeters.

The neck of this vessel was sharply constricted. With one or two exceptions, all the other vessels were of the same general form but somewhat smaller.*

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*In a future paper we desire to give a more detailed description, accompanied by cuts, of the pottery found in these mounds, together with that of the pottery (now in the writer's possession) showing the impressions of textile fabrics, from ancient mounds in other parts of Iowa.

Some years ago Mr. Capron made an excavation in this mound and took out numerous small pieces of pottery, and one sinker larger and finer than either of those obtained by the writer.

About 6 feet to the northeast from the mound was a saucer-shaped depression 10 feet in diameter and 1½ feet in depth, from which dirt had been taken in the construction of the mound. It is stated by Mr. Capron that this excavation was originally much larger.

On a much lower and level space (marked A on the map) on the bank of the now abandoned channel of the river, and about 40 rods to the northwest from the mound, considerable quantities of broken pottery some of it differing greatly in decoration from any found in the mounds, has been plowed up. Considerable numbers of arrow points, together with lance points, drills, hammers, flint chippings, etc., have also been found.

It seems quite probable that this was the site of a village of these ancient people who erected the mounds.

About half a mile to the northeast from the above described mound another isolated circular mound occurs. This is located upon the extremity of the brow of a rather high and abruptly truncate ridge, which here approaches to within a few rods of the Cedar. From this point a fine view of a considerable portion of the valley may be gained. This mound, which was opened by parties from Charles City some years ago, was said to have been circular, 20 feet in diameter, and 2 feet in height.

But little information as to the result of the exploration of this mound has been obtained by the writer, save that a considerable quantity of fabric and cord marked pottery, much of it similar to that obtained from the mound on the Capron farm, was found, and that it had been subjected to the action of fire after having been placed in the mound. Several fine specimens of this pottery were sometime afterward presented to the writer by one of the party making the exploration. The larger fabric-marked specimen is of peculiar interest from the fact that in the manufacturing of the vessel the hand was used in pressing the plastic clay into shape,* the interior of the vessel (that portion of it known) showing deep depressions or indentations made by pressure of the hand or fingers, this giving both the interior and exterior of the vessel an uneven surface.

This vessel appears to have been formed by placing the material in some subelastic mold (perhaps of willow) and pressing into form by the hand; but prior to which the mold had been lined with some coarse woven fabric, for, perhaps, the purpose (1) of facilitating the removal of the vessel from the mold, and (2) for the purpose of ornamentation. Near this mound was found (by Mr. Burt Harwood, one of the explorers of the mound) and presented to the writer numerous arrow points, a fish-spear (according to Abbot), knife, and a fine plumb-bob.

The point of special interest regarding the arrow heads is their (in some cases extreme) rudeness of form. The knife, which is the most beautiful specimen of its kind that we have ever seen, is of milky quartz, 7¾ centimeters in length, about 3 centimeters wide at the middle, and tapers to a point at either end.

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*In all other observed examples some smooth instrument was used for this purpose.

The fish spear has a length of 5½ centimeters and width at the base of 2 centimeters; this spear point tapers gradually to the front, the forward half very thick and heavy, the breadth and thickness being about equal.

The plumb-bob is a beautiful symmetrical specimen, ovate in form, with a length of 5¼ centimeters and diameter of 5¼ centimeters. Running longitudinally around this specimen is a rather profound groove.

The three last named implements, knife, spear, and plumb, are, so far as known to me, of very rare occurrence in Iowa.

On the second ridge, west (which is slightly lower) from the line of mounds, and directly opposite mound No. 14, is another isolated mound. This mound is 42 feet long from north to south, and 30 feet wide and 1 foot high at the center. Formerly a fair-sized oak tree occupied the surface in the center of this mound. Many years' working of the plow has reduced the height to a considerable degree.

About 3 feet from the base of the northeast part of the mound was a saucer-shaped depression (originally larger and deeper) about 22 feet in diameter and 1 foot deep. Along the entire east side at the base was a depression somewhat shallower than the first one. From these depressions dirt had been taken for the construction of the mound.

Near the northeast part of the mound, and 2 feet below the surface of the mound and 1 foot below the natural surface of the ground around the mound, was found part of a calcined skull and several leg and arm bones. These bones had the appearance of having been placed here in a loose, careless manner, most of them lying directed north and south. Five feet to the south of the remains of the first body were the remains of a second body. This body was represented by a somewhat larger number of calcined leg and arm bones than the first one. The condition of the few well-preserved teeth found with these bones would indicate that they belonged to a person somewhat past middle life. The long bones, with one exception, all lay directed north and south.

Both bodies found here had been cremated at some other locality before being placed in the mound. From near the surface of the mound was obtained a few pieces of charcoal, flint chippings, and a small piece of pottery.

The bones in this mound, as well as the bones in many of the other mounds examined, had been considerably gnawed, and some of them destroyed, by the pouched gopher (*Geomys bursarius*). These burial mounds being usually located upon the highest and dryest portion of a region offer special inducements for these troublesome rodents to appropriate them for their domiciles, which they often have done.

The charcoal found in this mound and in the mound on Mr. Capron's farm as well was of a very fine-grained compact wood, differing widely from the oak.

Judging from the great difference (in many respects) in the mode of burial, the state of preservation of the bones, etc., it seems not improbable that they are the remains of a different tribe of the mound-builders from those who erected the line of mounds, and that the interments were made at a period considerably prior to those interments in the line.

The material of all the mounds, except the charcoal and burned clay mentioned, is a black, homogeneous drift soil, such as everywhere occupies the surface of the region. No "dugholes," ditches, or excavations of any kind (with the two exceptions noted) were observed near or adjacent to the mounds, from which earth might have been taken for their construction. The diameter of the mounds and their distance apart has been ascertained by pacing.*

One-third of a mile to the south of the line of mounds, and at a lower level, are situated several circular mounds (now nearly obliterated by the cultivation of the soil) similar to those already described, none of which have been explored.

At Floyd, 4 miles farther up the Cedar from these mounds, there are several other ancient mounds which in general form and appearance approach those already described.

About 8 miles to the northeast from Charles City, on the southwest part of the northwest quarter of section 36, township 96, range 15, Floyd County, an ancient earth-work or fortification occurs on the east side of the Little Cedar River.† The topography of the region in the immediate vicinity of this stream is broken and possessed of considerable beauty of natural scenery. The valley of this stream is from one-fourth to one-half a mile in width, and its sides rise to a height of from 50 to 300 feet above the stream.

This fortification, as will be observed by reference to the accompanying map, is located about 150 feet distant from the bank of the abandoned channel of the Little Cedar River, and about the same distance from a ravine, which is located near the southeast extremity of the fortification and which is tributary to the Little Cedar. The bottom of this ravine and the abandoned channel of the Little Cedar, is from 18 to 20 feet lower than the base of the fortification. This fortification is located in the valley of the Little Cedar, the east valley side being one-fourth of a mile from it and, as before stated, rises many feet above it. The earth-work itself is 124 feet in length, 16 feet in width at the base, and 2¾ feet in height. The top is gently oval, sides gradually sloping to the base, and ends truncate. This earth-work runs about 17 degrees west of north, and is composed of the ordinary drift soil of the region.

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* Thanks are here due Mr. Scringer, who, although most of the area occupied by the mounds was also possessed by fine growing crops, willingly allowed an exploration of the mounds to be made.

† This stream is little more than a large creek, although receiving the appellation of "river."

No "dug-holes," or other excavations, were observed, from which earth might have been taken for the construction of the fortification.

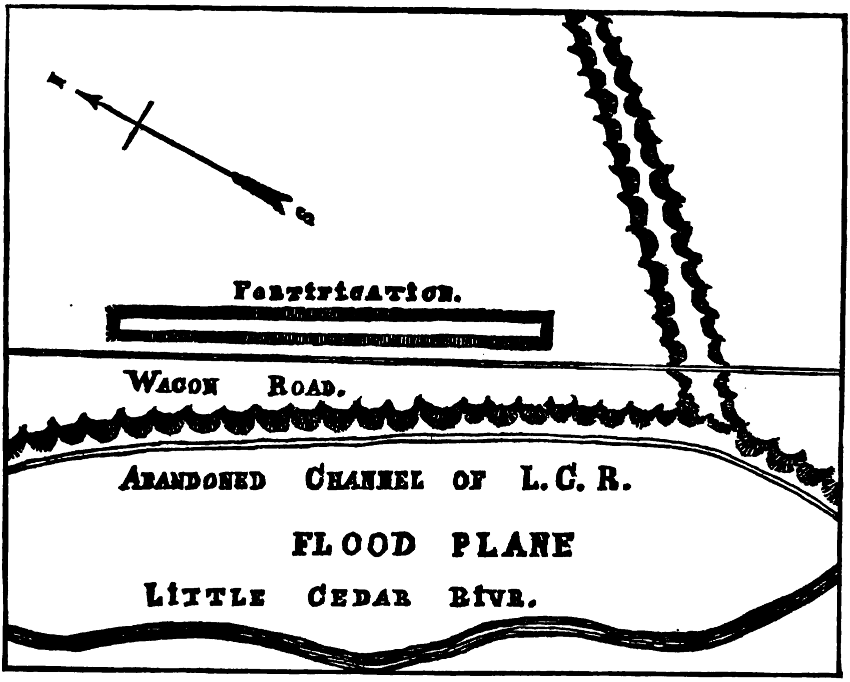

FIG. 5.—Map showing location of ancient fortification.

Several excavations had been made in different parts of this earth-work by various parties, but no relics were discovered. Flint arrow points are not unfrequently found on the surface in this region.

So far as is at present known to me, this is the first mound-builder fortification discovered in northern Iowa. It is reported that there occur in what is known as the "big woods," on the west side of the Little Cedar, 7 miles below the above locality, three mounds. These mounds are composed of drift bowlders and soil, are about 2½ feet high, 2 feet wide, and from 4 to 7 feet in length.

POSTSCRIPT.

At the time the preceding account of ancient mounds in Floyd and Cerro Gordo Counties was prepared, a portion of the surface near the southern extremity of the line of mounds was covered by an almost impenetrable growth of brush, vines, and weeds. Here were observed what appeared to be several artificial mounds; but, under the condition stated, there was so much doubt regarding their origin that no mention was made in the article regarding them; neither were they represented in the map accompanying the paper. A few weeks ago however we made another examination of the region. The brush, etc., had been cleared from the surface and burned, thus fully exposing the mounds. They were shown to be the work of human hands, and are represented in the accompanying diagram. No. 2 is accurately represented in the map given, and is here introduced simply to show its relations to the other mounds. No. 1 is an oblong mound, 30 feet long, 24 feet wide, and 2 feet high. From the center it slopes rather more rapidly to the north than to the south. The distance between No. 1 and 2, at B, is between 4 and 5 feet. No. 3 is a long mound, 81 feet in length, 15 feet wide at the base, and 2 feet in height at the center. The distance between this mound and No. 2, at C, is 24 feet. At A, an excavation, 1½ feet in depth, had been made; this excavation was much the deepest at the base of No. 2. Here doubtless was where a portion of the material for the construction of No. 2 was obtained. The material for the other mounds was apparently scraped from the surface in the immediate vicinity.

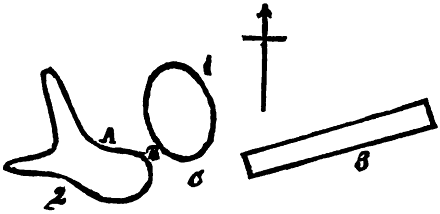

FIG. 6. Supplementary to Fig. 2. (p. 577).

These three mounds were apparently reared for the purpose of defense. Running north by northwest (in a line) from No. 1 are several small circular mounds from 8 to 10 feet in diameter. For what purpose these were raised, we are at present unable to state, as no exploration of them has been yet made.

INDIAN GRAVES IN FLOYD AND CHICKASAW COUNTIES, IOWA.

By CLEMENT L. WEBSTER, *Charles City, Iowa.*

Our Indians, like the wild buffalo, are fast disappearing before the advance of civilization. Only a few generations hence and the last vestige of this once noble race will have disappeared, and nothing be left to mark their occupancy of this broad and beautiful land of ours save the few graves of their dead which dot our hills and valley sides. And even these silent records of a fast vanishing race are rapidly disappearing with the march of time. So it seems fitting and well that whatever of interest they may possess be recorded now.

On a low but dry piece of ground, in what was known as "Carman's Woods," near the confluence of Beaver Dam Brook* with the Shellrock River, one-half mile north from Rockford, in Floyd County, a peculiar Indian grave is located.

This grave is 7 feet long, 2½ feet wide, 1¼ feet in height, and 3 feet in depth.

Mr. Merton T. Webster and the writer together made an exploration of this grave, but without finding human remains or relics of any kind. The grave had been excavated in the soil down to the underlying limestone strata. Running lengthwise through the center of the grave, from bottom to top, was a row of limestone slabs from 2 to 3 inches in thickness set up edgewise.

For the first foot the grave had been filled in with small fragments and blocks of limestone; the rest of it was then filled by laying in, obliquely, slabs of limestone on each side of the central row, one edge resting in the outer portion of the grave and the other against the central row of stones. The surface slabs were so large and heavy as to require the entire strength of one man to remove them.

The following section (Fig. 7) will illustrate this description.

Two miles northwest from Charles City, in Floyd County, are located a group of four Indian graves† This group of graves is situated on high, dry ground, back to the north from a small creek which comes in here from the east.

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* This is now called "Whisky Creek" by some.

† The exact location of this group and the isolated one above described are indicated on the map (Fig. 2) which accompanies the preceding paper entitled "Ancient Mounds and Earthworks in Floyd and Cerro Gordo Counties, Iowa," (*Ante*, p. 577.)

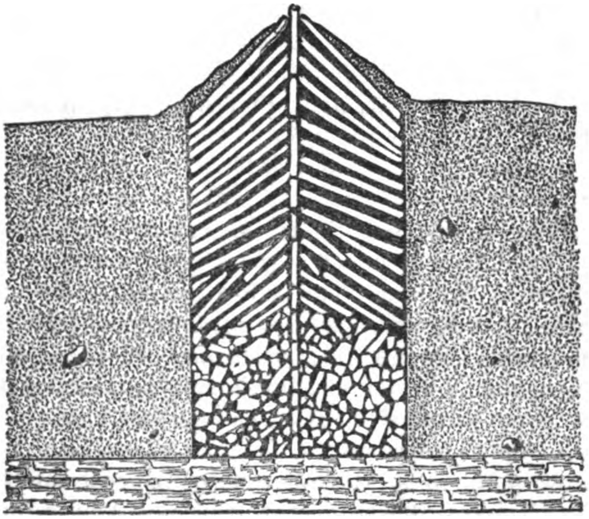

FIG. 7.—Transverse section of Indian grave near Rockford, Iowa.

These graves are apparently made like ordinary graves of the whites. With one exception they all lie directed northeast and southwest, the exceptional one lying due north and south. They all occur close together. Three of them are nearly 7 feet in length; the fourth one is that of a small child, and is only about 3½ feet long.

It is said by old settlers that these graves have been known here ever since the country was first settled, over thirty years ago, and that "they probably belong to Winnebagos."

About one-fourth of a mile to the west-southwest from the above described group an isolated grave might have been seen a few years ago. The history of the death of the one whose resting-place it was has been furnished me by some of the old pioneers of the section who were personally acquainted with the facts. The history, in brief, is this: In the winter of 1849–'50 a band of Winnebago Indians came in here from the east (?) on a hunting expedition; among the number was the son of the chief of the tribe, eighteen or twenty years of age. In chasing a bear this young Indian became over-heated, took cold, a fever setting in, and he soon died. His body was wrapped in his blanket and placed on the ground in the timber on a level space back from the creek a short distance. He was laid at length, with head to the northeast and feet to southwest. Slabs of green wood, 3 feet long, were then split out and placed over the body in an inverted V-shaped form, meeting at the top. The ends of this inclosure were then closed up by other slabs. At the head of this a post of green wood 6 inches in diameter was firmly driven into the ground, after the bark had been carefully removed. This post extended 3 feet above ground, and on it was rudely painted with some red pigment figures resembling Xs, Ys, etc. Around this inclosure a tight log crib was made. This crib was 10 feet long, 7 feet wide, and slightly over 3 feet in height, and was made of green unpeeled logs, from 6 to 7 inches in diameter, laid up in log-house style, and so notched at the ends as to leave but little if any space between them, this being intended to keep the wolves and other wild animals from the body. Over the top of the crib were tightly fitted other logs. The skull of this Indian is now in the possession of Dr. J. W. Smith, of Charles City.

One mile below the above-described grave, in the timber on the south bank of an elbow of the Cedar River, which extends out here to the east, there might have been seen a few years since the graves of several Winnebago Indian children. The bodies had apparently been placed on the surface of the ground, and on all four sides logs 12 inches in diameter had been arranged, the space inclosed being filled in with earth, and a mound 13 inches or more in height raised over the body. These graves were situated on the bank, 10 feet above and 10 or 15 yards distant from the stream.

On the brow of the hills, which here form the east valley side of the Little Cedar River, at Bradford, in Chickasaw County, and where a beautiful view of the surrounding region is afforded, formerly existed a Winnebago burial ground. Here more than twelve Indians were buried. Their bodies were wrapped in their blankets; a quantity of provisions, their guns, and other things, supposed to be needed in the "happy hunting ground," were placed at their sides. Over the body an inclosure was formed by driving staves into the ground obliquely on each side, meeting at the top, as described in the burial north from Charles City.

As these graves were located on the prairie, no log crib was placed around this inclosure; but instead, clods of earth were arranged all around the outside, completely covering the slabs from view save a slight portion at the top. In the heavy timber on the west side of the stream at this place numerous other graves existed. Here tight log cribs, similar to the one already described, were placed around the inner inclosure. In one instance the body of the dead was put in a rude slab coffin and placed on crotched poles, 10 feet from the ground. In another instance the body of a papoose was laid in a rough slab box, and this placed in the crotches of a tree.

Whether the two last burials were those of the Winnebagoes, or those of some other tribe, I am unable to state with certainty, although the settlers living in the region at the time affirm that they were those of the Winnebagoes.

The Indians in passing up and down this stream during the summer and fall "would place wisps of June grass on the graves of their dead,"

ANCIENT MOUNDS IN JOHNSON COUNTY, IOWA.

By **Clement L. Webster**, *Charles City, Iowa.*

Johnson County occupies a position in the southeastern portion of the State. Its topography is peculiarly that of loess regions, being for the most part a very rolling and (along the streams) broken prairie country. This area is watered by the Iowa River and its tributaries. The Iowa is a beautiful meandering stream. Entering the county near its northwest corner, it flows almost due east to the center of the county, where it abruptly turns and continues its course through the region in a south by southeast direction. The valley of the Iowa River and its tributaries is relatively narrow and deep, and bordered by more or less steep acclivities and flanked at frequent intervals by deep but narrow and rapidly ascending ravines.

The immediate valley of the Iowa River attains an average width of slightly over one-half of a mile, and its channel has been eroded to a depth varying from 50 to over 175 feet below the valley borders. The small tributaries have also eroded their course to a depth of from 10 to 80 feet. There are no extensive marshes or swamps.

The soil of the area is for the most part a yellow homogeneous loess, and is of quite inferior quality for farming and the production of the cereals compared with the rich black drift soil of other portions of the State to the north.

The valley of the Iowa, especially in the northern half of the county, with its heavy skirting of timber, fluted sides, and often bold escarpments of Devonian rock, is perhaps one of the most beautiful regions in the State.

This valley was once the seat of a populous settlement of the mound-builders, as is evidenced by their remains. Of these silent records of a long vanished race the most important as well as the most legible are the earthen mounds which cover the bones and dust of their dead. They crown many of the peaks and ridges of the bluffs, most of them assuming only moderate proportions while large numbers are mere swellings of the surface not readily recognized as being of artificial origin—this arising mainly from the degradation by the plow.

Along the Iowa in this county there are known to be, or have been, at least one hundred of these mounds. It would be useless labor and waste of time to attempt to locate on a map the situation of each mound in Johnson County, and a tedious and unprofitable repetition to detail minutely the examination of each separate mound.

For brevity of description they can be readily grouped in two classes according to their form, and the description of one will answer generally for all of its particular class.

The first class of mounds, and by far the largest in number, are circular at the base and have an oval or flattened top, a diameter varying from 12 to 24 feet, and a height of from 1½ to 3 feet. The second class of mounds are long and narrow, sometimes forming an extension to one of those of the first class. These mounds have, so far as observed, a length varying from 45 to 130 feet, with a width of from 12 to 13½ feet, and a height varying from 1½ to 2 feet.

Near Mr. Iker's, 5 miles north from Iowa City, occurs an interesting group of these ancient mounds, eighteen in number, located in a line on the summit of a high, narrow ridge, which forms the east bank of the Iowa and the west bank of Sanders Creek, and extends nearly parallel to them.

The highest point of this ridge rises about 100 feet above the bed of the Iowa River, but to a lesser height above the bed of the creek. From this ridge a beautiful and more or less extensive view of the valley is obtained. The mounds are arranged in a slightly curved line, following the crest of the ridge. The surface of the summit of the ridge has a slope of several feet from the south to mound No. 5. From mound No. 12 the surface gradually rises until within about a quarter of a mile an altitude varying from 25 to 30 feet is attained above the base of this mound.

The accompanying map will illustrate the position and relation of the mounds to one another, while the table will give their dimensions, etc.

No.	Width.	Length.	Height.	Direction.	Distance.
	Feet.	*Feet.*	*Inches.*		*Feet.*
1	24	....	24	N. to No. 2	54
2	20	....	24	N. to No. 3	45
3	18	....	24	N. to No. 4	40
4	16	....	27	N. to No. 5	72
5	24	....	36	N. to No. 6	33
6	12	130	18	N. to No. 7	36
7	18	....	24	N. to No. 8	15
8	17	....	30	N. to No. 9	48
9	15	....	30	N. to No. 10	30
10	15	....	24	N. to No. 11	75
11	16	....	30	N. to No. 12	33
12	13½	45	20	N. by NE. to No. 13	30
13	14	....	36	N. by NE. to No. 14	125
14	17	....	24	N. by NE. to No. 15	24
15	12	....	18	N. by NE. to No. 16	24
16	24	....	24	N. by NE. to No. 17	170
17	19	....	36	N. by NE. to No. 18	90
18	24	....	36	....	....

Most of the mounds have been partially, and a few thoroughly, explored by Mr. M. W. Davis, of Iowa City, who has taken much interest in their study and the securing of their relics, of which he has now quite a large and valuable collection obtained from this county.

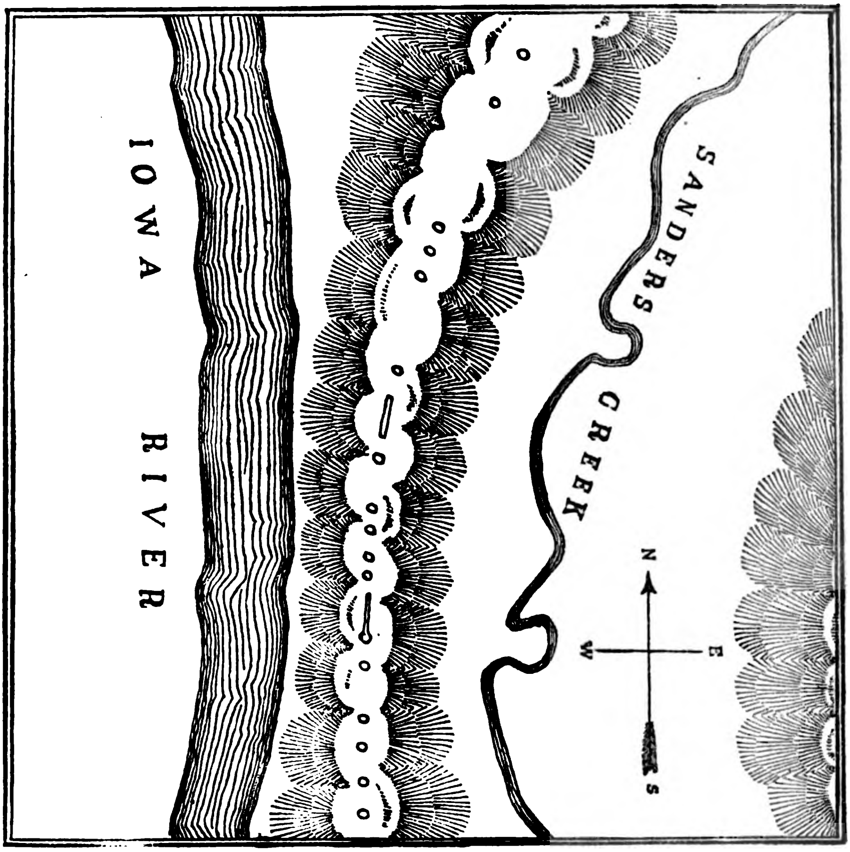

FIG. 8.—Map showing position of Mounds.

To Mr. Davis I am indebted for most of the notes on the exploration of these mounds.

In mound No. 1 (counting from the south) a skeleton of an adult individual, in a sitting posture, was unearthed; near this was also found a small peculiar shaped vase of burned clay, made apparently to represent some horned ruminant. These relics were found at or slightly below the natural surface of the ground around the mound. In mound No. 2 was found the skeleton of a child, "apparently about seven years old." The bones in this mound, as well as the bones in mound No. 1, were in a poor state of preservation.

It is reported by Mr. Davis that in nearly all other mounds examined by him fragments of human bones were found, and in nearly all mounds a layer of charcoal and ashes occupied a horizon a few inches above the human remains. He also reports the finding of several burned drift bowlderettes in some of the mounds.

Mound No. 11 was partially explored by the writer by making a trench 2 feet wide and 2½ feet deep through it from north to south. Nothing was found save an arrow point, a few flint chippings, and several bowlderettes of drift origin, probably placed here by human hands. No evidence of fire was noticed.

Mound No. 6 is of peculiar form, and for what purpose it was originally constructed is difficult to conjecture. The large expansion at the south end is circular in basal outline, with a diameter of 40 feet and height of 1½ feet. Extending north from this portion is a long, oval, or slightly flattened mound. The entire length of this mound, as indicated in the table, is 130 feet. Some feet north from the large expansion the writer made a trench 2 feet wide across this mound, but without finding any trace of fire or relics of any kind.

Mound No. 12 is another peculiar form, and appears to have been raised for the same purpose as mound No. 6, whatever that may have been. This is unexplored.

The material of all the mounds (except the ashes and charcoal mentioned) is a yellow homogeneous loess, with a dark humus-stained layer at the top, such as everywhere occupies the surface of the country. No "dug-holes" or excavations of any kind were observed near the mounds from which their material might have been taken. The ridge and mounds here are covered by a heavy growth of young oaks, hickories, poplars, etc.

On the opposite side of the valley, and slightly below this group, is another group of five circular mounds. These occupy a position on the brow of a ridge which commands a beautiful view of the valley and country to the east.

As these mounds are in the main identical in form and structure with the circular ones of the first group, a delineation of them here is unnecessary.

These mounds have been partially explored and the finding of human bones in them reported. Near the mouth of Turkey Creek, 2 miles north from the first group of mounds described, an isolated circular mound occurs. This mound is situated on the brow of a perpendicular cliff of Devonian limestone which rises to a height of 100 feet (by estimate) above the water of the Iowa, and constitutes one of the highest and most sightly localities of the vicinity. This mound is somewhat higher than any of those previously described. It has been partially explored, but with what result is unknown to the writer.

Near the flouring mill, half a mile north from Iowa City, there occurs, on the top of a high but rather narrow ridge, two series or lines of circular mounds. This point commands a fine view of the surrounding country. The mounds are usually low and from 20 to 21 feet in diameter and 30 feet distant from one another. They occupy the center of the ridge, and in doing so are sometimes deflected from a true north and south line. There are from fourteen to sixteen of these mounds, a large number of them having become almost obliterated in the cultivation of the soil.

A portion of these mounds was explored many years ago, but with what result we have been unable to learn.

About one-half or three-quarters of a mile to the northwest from the mill, a row of from fourteen to sixteen long and circular mounds existed, but most of them have now disappeared before the plow. The form and dimensions of these mounds were about the same as those already described at other localities.

As these mounds were long since explored, it is unknown to us what relics, if any, were obtained.

At various other points along the Iowa River, in Johnson County, circular and linear mounds occur. At no locality have "dug-holes," trenches, or other excavations been observed near the mounds which would indicate where the material was obtained for their construction.

Although stone relics are rarely found in the mounds, yet field relics, such as stone axes (sometimes very large), drill- arrow- and lance-points, etc., are common.

It is a matter of regret that a complete record of the results obtained in the exploration of these interesting mounds has not been kept.

ANCIENT MOUNDS IN IOWA AND WISCONSIN.

By **Clement L. Webster**, *Charles City, Iowa.*

Along the shores of the "Father of Waters" in Iowa and Wisconsin there once existed large numbers of that deeply interesting but little known race, the mound-builders. How long the shores of this mighty river continued to be the home of portions of this race, can not even be conjectured. But the valleys and bluffs of this cliff-bound river are dotted with the monuments of these departed people.

Large numbers of these ancient mounds have been explored and the record given to the world of science, while perhaps a still larger number have been explored and the records and relics lost.

In this paper is chronicled the result of explorations in a few of these ancient mounds. These explorations were made by Dr. W. T. Knapp, now of Charles City, Iowa, and to whom I am indebted for most of the following facts:

In the town and vicinity of Guttenberg, which is located on the level flood-plain of the valley of the Mississippi, on the west or Iowa side of the river, are located large numbers of small circular and long mounds, most of which were reared apparently by the present Indian race.

Large numbers of these mounds have been opened by those incited merely by curiosity, and many valuable facts and relics obtained only to be so on irreparably lost.

Nearly, if not quite all, these mounds contained, in greater or less abundance, implements, ornaments, etc., of copper, silver, and stone, as well as human remains.

Some of the mounds here are 124 feet in length, and contain great quantities of human bones. Numbers of these burials have been made in recent time and have been witnessed (so claimed) by white men now living. Most of the burials are those of Indians.

One mound at Guttenberg opened by Dr. Knapp was circular, 16 feet in diameter at the base, and 3 to 4 feet in height. In the center, 2 feet below the surface of the ground at the base of the mound, was discovered a human skeleton, the bones being in a fairly well preserved condition. On each side of the head was found a large circular silver ornament, 2 inches in diameter, which, from their position, would indicate that they had been worn suspended from the ears. With the body was also found a number of flint arrow points. There was no evidence that fire had been employed at this burial. The material of the mound was rather soft, moist soil. There seems to be no doubt but that this burial was that of an Indian.

About 4½ miles west from Guttenberg, on the steep side of a deep ravine, through which Miners Creek courses its way, was a burial mound. This mound was located about 60 feet above the bed of the creek, and was some 7 feet wide and 10 feet long. Excavations in this mound revealed the presence of a well-preserved human skeleton, together with stone arrow points, pestle, pipe, and other implements of stone. The pipe (which the writer has personally examined) was a beautiful and finely wrought specimen, made from red pipe-stone. The soil from which this mound was constructed was soft—considerably softer than the earth surrounding it. This was doubtless an Indian burial.

On the brow of a bold perpendicular bluff, which rises some 250 feet above Buck Creek, near where it empties into the Mississippi and between 5 and 6 miles southeast from Garnavillo, Iowa, an earthen mound occurs. This mound had a circular basal outline and oval top; was 3½ feet in height and nearly 24 feet in diameter. In the center and 2½ feet below the surface of the soil surrounding it a finely preserved human skeleton was discovered. The body had been placed at length, with the head to the north and the feet to the south. The temple of this individual had been crushed in as if by a heavy blow from some blunt instrument, and which had doubtless been the cause of death. No implements or ornaments were reported found with this body.

The material from which this mound had been made was not packed, as is frequently the case with many other ancient mounds in different portions of the State. The summit of this bluff was covered with timber, and one large "hard maple" tree, about 2 feet in diameter, occupied the surface of the mound.

Near Buena Vista, in Clinton County, Iowa, between 3 and 4 miles west from the Mississippi, there occurs on the summit of a high hill a very interesting ancient mound. On exploring it a rude box, constructed out of large stone slabs, was discovered, and in it the remains of a human skeleton. The body had been placed at length, with the head to the north and the feet to the south. In the box with the body a large quantity of stone implements, as arrow points, axes, etc., were found.

Near Cassville, Wis., a sub-circular mound, 40 feet in diameter and 5 feet in height, is situated. This mound is located on the flood-plain (above the reach of high water) of the Mississippi, and less than 100 feet back from the margin of the stream. A partial exploration of this mound was made, and human bones discovered, some 2 feet below the base. With the human remains was found a considerable quantity of stone implements, among the most interesting of which were a number of hoes or spades, two of the finest of which are now in the author's collection. These hoes were made from chert, probably derived from the Silurian rocks of the region, which in places contain great quantities of nodules of this material. The largest hoe in the writer's possession has been rather roughly chipped out; is 4 inches in length and 2 inches in width; the lateral margins nearly straight or slightly curved, the anterior end rather broadly rounded, and the posterior truncate. The smaller specimen is cordate in outline, 2¾ inches in length, 2¼ inches in greatest width, and abruptly truncate posteriorly. Growing on the surface near the center of the mound was an oak tree 2½ feet in diameter.

Near the last mound was another circular mound, 15 feet in diameter and between 3 and 4 feet in height. Close to the center of the mound, and 2½ feet below its base, a single human skeleton was unearthed. The body had been placed on its back with the head to the north. The knees were drawn up to the breast, the elbows bent, and the hands brought to the sides of the face. With the body were found large numbers of copper ornaments, which, from their position, showed that they had been used as leg and arm ornaments. Judging from the structure and delicacy of the bones, this body was that of a woman. Fire had apparently not been used at this burial.

On the Mississippi, 6 miles north from Glen Haven, Wisconsin, are situated four or five ancient burial mounds. These mounds are composed of sand and are from 18 to 20 feet in height and from 20 to 30 feet in diameter.

Owing to the fact that the owner of the land on which two of these mounds are located was unwilling that these works should be disturbed, the internal structure and contents of them is unknown. One of this group of mounds, partially explored by Dr. Knapp, contained large quantities of human bones.

Near Glen Haven is an interesting Indian grave. This grave is located on a flat ledge of rock on the bank of the Mississippi, 50 feet above the stream and at the base of the bluffs which form the valley side, and which rise from 200 to 300 feet above the water in the stream. A few feet from this grave a spring of water issues from the rocks. The body had been placed at length in a rude box made of slabs of limestone and with the head to the north and feet to the south. Over this box a small earthen mound had been raised. With the body were found (lying near the breast) large numbers of stone implements, as axes, arrow points, skinners, pestles, etc., some of them objects of much interest. One or two old pioneers of the region, who claim to have been present at the burial of this Indian, assert that it was that of the half-brother of Black Hawk. As to the truthfulness of this statement, however, we do not vouch.

The measurements of the mounds and their exact position relative to known points given in the foregoing description may be regarded as only approximate.

Method of flint-chipping.—Some years ago Dr. Knapp, while making a reconnaissance of "Twelve-mile Island," in the Mississippi near Guttenberg, Iowa, made the acquaintance of a roving band of the Pottawatomie Indians who were encamped for the time on this island. While among them he witnessed the process of flint arrow-point manufacturing as carried on by this band, and as the writer has not observed a description of this process in print before, a short account of it is here given.

A tree from 12 to 20 inches in diameter was selected and a large notch or cavity 6 inches in depth was made in one side of the trunk at a sufficient distance from the ground to allow of a person occupying a sitting posture on the ground to work this "instrument" with facility. The upper portion or roof of this cavity sloped obliquely downward; the farther side was perpendicular and the bottom horizontal. On the bottom of this cavity a small even slab of rock of some hard material was placed. A short distance above this rock a small hole or notch was made in the farther side of the cavity. Into this notch was inserted the "leg bone of a deer," and under this was placed, edgewise and resting on the basal rock below, the piece of stone to be wrought, this possessing the quality of conchoidal fracture. The implement was then deftly worked out by pressure of the carefully manipulated cylindrical bone.

The size of the instrument to be wrought was regulated by moving the specimen farther from or near to the outer margin of the basal rock.

This description may be further illustrated by the following cut (Fig. 9) from a rude sketch of the "instrument" made by Dr. Knapp:

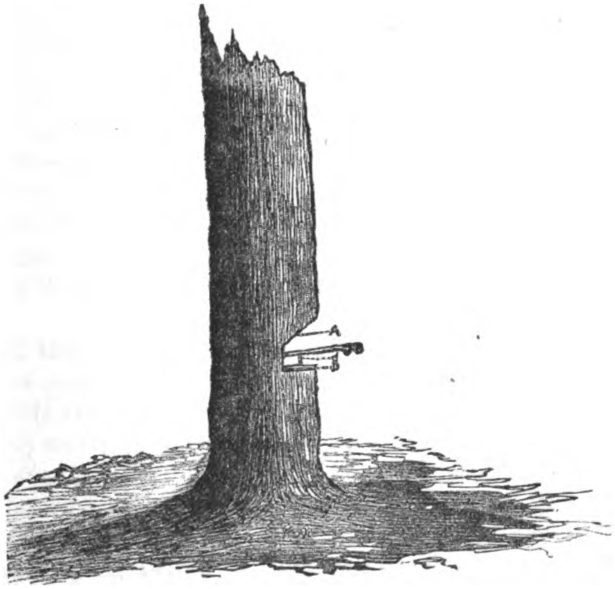

FIG. 9.—(*a*) Cavity cut in the tree; (*b*) cylindrical bone of "deer's leg;" (*c*) stone to be wrought; (*d*) basal stone.

Another method of flint arrow-point making (which we have not seen noted elsewhere) practiced by some of the existing tribes of Indians was described to the writer by Hon. S. P. Leland, of Charles City. This method was observed by Mr. Leland as he was among some of the Indian tribes of the Western Territories a few years since.

This process consisted in the application of heat and pressure. First, three stones of some hard material not easily acted upon by heat, of a rounded form, about 5 inches in diameter and 6 inches in length, were placed in the fire and heated hot. Then a fragment of stone of suitable size and quality was selected to be wrought. One of the stones was then taken from the fire and applied with pressure to the edge of the piece of stone to be worked, this causing chips or flakes to be broken from the piece. While the first stone was still hot it was replaced in the fire and a second one taken out and used as the first. This process was repeated until the work in hand was finished. By this method beautiful arrow points were wrought.

MOUNDS OF THE WESTERN PRAIRIES.

By **Clement L. Webster**, *Charles City, Iowa.*

In travelling over the beautiful prairies of the West the attention of the traveller is struck by the beauty and number of the flowering plants which are presented to view on every hand, their bright yellow, blue, pink, and other varied colors and hues being in happy contrast to the rich green of the prairie grass among which they mingle. The different portions of this emerald expanse, as high and low, wet and dry, support, to a greater or less extent, their own peculiar flora. The fineness, coarseness, richness, or sterility of the soil of its different parts have often a marked effect upon the distribution of many of its species.

Regions much trodden over by the cattle, on the large Western ranges, present beautiful fields of gold, in the latter portion of the season, by the blooming of myriads of plants of the order *Compositæ*, many of which are represented by the genera *Vernonia*, etc.

Another characteristic which attracts the attention of the traveller who for the first time passes over this beautiful region is the scarcity or absence of all arboreal vegetation, the only timber of this region being confined to the margins of some of the streams which meander through it and the small isolated groves which occur upon it.

But a widely prevalent feature, which attracts perhaps no less interest but more speculation, even among many of those who have long inhabited these prairies, is the great number of isolated or grouped mounds which are seen over the surface, and which are often denominated by the inhabitants as Indian mounds. These mounds are generally circular and have an oval or flattened top with a diameter at the base of from 4 to 20 feet, and commonly rise to a height of from 1 to 3 feet.

Although the marginal outline of these mounds is usually circular, still at times some of them are oblong or have a gently flowing contour. These mounds are either isolated from 5 rods to 1 mile from one another, or are closely and irregularly grouped, or grouped into rude circles, semicircles, or even straight lines. In some instances, as many as sixteen of these mounds have been counted in an area containing about 2 acres.

The location of these mounds is almost exclusively in the prairie regions and may be found on high and dry or low and rather moist land. In Iowa and southern Minnesota, where these mounds have been most studied by me, they may be seen for many miles over the level prairies of these regions.

During the summer and early autumn they are usually clothed with a very luxuriant and rank growth of perennial plants, most prominent among which are observed *Calamagrestis canadensis*, *Vernonia pasciculata*, etc. These rise to a height of from 4 to 13 feet above the surface of the ground at the base of the mound, and thus constitute a very conspicuous feature of the surface.

Although the external appearance of these mounds is analogous to that of some of the Indian mounds of Iowa and other States, still they may be distinguished from those of the mound-builders by their relative position and the region occupied, as well as by their greater irregularity of contour.

For more than twenty-five years I have resided in the prairie regions of the West, and have thus been afforded a fine opportunity to study the origin and development of these "singular" mounds. By far the greater number of them owe their origin to the pouched gopher (*Saccomyidæ bursarius*), that year by year has made additions to them by dirt brought forth in the extension of their under-ground channels until they finally assume the proportions now seen. Upon the death of the animal, or for some other cause, these mounds and channels are finally abandoned and the mounds left to be taken possession of by the indigenous plants of the region, which are always, under such circumstances, of much ranker growth than is usual under other conditions.

Others of these mounds are developed by the American badger (*Taridæ americana*) and the prairie wolf (*Canis latrans*). The mounds formed by the badger and wolf may be distinguished from those of the pouched gopher by their large and partially filled burrows. The burrows of the badger are always located upon the highest and dryest portions of the region, and those of the prairie wolf usually upon the border of "runs" or general surface drainage depressions of the country. These mounds have sometimes been described and *published* as works of the "mound-builders."

THE TWANA, CHEMAKUM, AND KLALLAM INDIANS, OF WASHINGTON TERRITORY.

By Rev. MYRON EELLS.

NAMES AND SITUATIONS OF THESE TRIBES.

Twanas.—The name of the Twanas is spelled Too-au-hooch, in their treaty. The Klallams pronounce it Tu-an′-hu. The Twanas say Tu-ád-hu. The difference between the Klallam and the Twana language here exemplified is often observed—the Klallam being the more nasal. These various pronunciations have been shortened into Twana, now used in all governmental reports. It is said to mean a portage, and to be derived from the portage between the head of Hood's Canal and the main waters of the Sound, where the Indian, by carrying his canoe 3 miles, avoids rowing around a peninsula 50 miles long.

These Indians originally occupied both sides of Hood's Canal, and were divided into three bands, the Du-hle-lips, Skokomish, and Kolsids. The Du-hle-lips lived at the head of the canal, where a small stream empties into it, now called Du-lay-lip. Fifteen miles below them were the Skokomish, who lived around the mouth of the river of that name, now their reservation. This word is pronounced Skâ-kâ-bĭsh by the Twanas and Ska-ka-mĭsh by the Klallams. The Americans have changed it to Skokomish, and thus they universally spell the name of the river, reservation, and post-office. Dr. Gibbs, in vol. I, "Contributions to North American Ethnology," gives this as the name of the tribe, but it was originally the name of only one band. Yet even now, because of its being the name of the reservation and river, these Indians are known fully as well by the name Skokomish to the whites on the Sound as by the name Twana. Skokomish means the "River People;" kâ, signifying fresh water, is doubled to denote one form of the plural, probably because of the size of the river, which is by far the largest that empties into the canal. The termination *ish* is very common for the Indian names of tribes and streams on the Sound. I incline to the opinion that it comes from what is called the old original form of plural in the Twana language—the suffix *obish.*

There are two ways of forming the plural—one by reduplication, the other by adding this termination; both seem to be combined in this word. The prefix letter *o* is, I have often noticed, in other words.

In conversation I have heard them pronounce the names of the tribes Makah and Haidah, S'ma-kah and S'haidah, and yet when I have asked how they pronounce the names of those tribes they would reply Ma-kah and Haidah. Many times, too, in collecting common words they have been pronounced as beginning with an *s*, and in a second pronunciation the letter would be dropped. After careful inquiry I have generally concluded to drop the *s* as the more correct. When first used by the whites the whole word was written S'Kokomish.

Thirty miles below this band were the Kol-sids, as pronounced by themselves (or Kol-sins by the Klallams), who lived around the bay of that name and the mouth of the Dos-wail-opsh River. Their name is now variously spelled by the whites: Colcins, Colcene, Colseed, and Quil-cene. These three bands were not always at peace, but sometimes waged petty war with each other. For twenty years, however, they have mostly been collected on the same reservation, have been on good terms with one another, and have intermarried, so that the band distinctions are rapidly becoming obsolete. Yet, when the older Du-hle-lips have the reservation for fishing they are apt to go to their old waters, and the same is true of the Kol-sids.

The dialects of the different bands formerly varied a little: Thus the word for *go* in Du-hle-lip was *bĭ-se-dab*, but in Sko-ko-mish *bĭ-hé-dab.* At the present time, not finding it practicable in collecting the vocabulary to separate the dialects, I have gathered most of the words from older school-boys who have been brought up on the reservation and familiar with the different dialects which are now rapidly merging into one.

At present most of these Indians live on the reservation. A few families live between it and Seabeck, 30 miles north of the reservation; about thirty persons make Seabeck their home, where the men earn their money mainly by working in the saw-mill and the women by washing.

Although the Skw-aksin tribe by treaty and language belong to the Nisqually Indians, yet about thirty of that tribe, since the selection of the Skokomish reservation, have moved to it and become incorporated with the Twanas. They have done so because their own people are scattered and nearly extinct as a tribe and because of the nearness of the reservation to their old haunts and numerous marriages between them and the Twanas. They use their own language for the most part, but the majority understand the Twana, and the Twanas understand them.

Chémakums.—In the treaty their name is written Chemakum; George Gibbs writes it Tsemakun; J. G. Swan spells it Chem-a-kum, which represents the way in which both the Indians and whites of this region pronounce it. The whites call a prairie by this name. Its origin or meaning I can not learn. These people call themselves Á-hwa-ki-lu. They occupied the land from the mouth of Hood's Canal to Port Discovery Bay. According to their tradition and that of the Kwilleuts, they originally came from the latter tribe, who live on the Pacific coast south of Cape Flattery, 125 miles distant, and from whom they are now separated by the Clallams and Makahs. In regard to this, J. G. Swan says that the Kwilleuts have a tradition that a long time ago there was a very high and sudden tide, which took four days to ebb, after which a portion of the tribe made their way to the vicinity of Port Townsend, and are known as Chemakums. The latter tribe have a similar tradition. The Chemakum numerals seem to corroborate this legend. They are said to have been originally a war-like tribe, not very numerous, but strong and brave. They had a village at the head of Port Townsend Bay called Tsóts-i-bûs, which was a kind of a capital for nearly all the tribes on the Sound, where they occasionally collected. George Gibbs, in 1852, states that their number is ninety, but they are now virtually extinct, there being only ten left who are not legally married to white men or into other tribes. Of these ten there is only one complete family, four in number. With the exception of two or three very old persons, they now mainly speak the Klallam language. They say that their diminution was caused by small-pox, but probably war had something to do with it, as Gibbs says they have been engaged in wars with the Makah, Klallam, Twana, Suokomish, and Duwamish Indians, by whom their power has been broken.

Klallams.—In the treaty this name is spelled S'Klallam, but I am inclined to think that the "s" is the same as that in S'kokomish. Other tribes now call them Klallam, from which the whites have derived this word; but it evidently originated from their own name for themselves, Nu-sklaim, meaning a strong people, for they were formerly a strong tribe. Their territory at one time extended from Port Discovery Bay to the Hoko River, on the northern coast of Washington Territory. The treaty expected them to go to the reservation, and the Government was to furnish the means for this purpose. This was never done, and they have never been moved, except that some have occasionally been taken there for a limited period as punishment for crime. At present many of them have moved further up the Sound to obtain work. Their villages are now as follows:

(1) Opposite Seabeck, where for a long time about thirty have lived, but of late all but about a dozen have moved to Port Gamble. Their main dependence for money is from their work at the saw-mill.

(2) Opposite Port Gamble, across the bay, 20 miles north of Seabeck, are about one hundred who earn their money principally at the saw-mills there. This village is enlarging and has a small Catholic church.

(3) Around Port Ludlow, 6 miles north of the last place, are nine who depend on the saw-mill there for their living.

(4) In and around Port Townsend, 13 miles north of Port Ludlow, are about twenty. More would live there, as from the size of the place they could easily find work, but the facilities for obtaining whisky are so great the agent has forbidden them to come there.

(5) Around Port Discovery, 14 miles west of the last place, are nearly

forty Indians who gain their livelihood mainly from the saw-mills at that place.

(6) Fifteen miles northwest of them is Sequim, where there are forty more. Most of these are old or infirm people who get their food chiefly from the water, but make some money by canoeing for the whites to Port Discovery and Port Townsend.

(7) Six miles north of Sequim is Jamestown, near Dungineas, in and near which are about one hundred. Six years ago these Indians were so worthless (being almost constantly drunk) that the surrounding whites were considering the subject of petitioning the agent to remove them. Hearing of this the leading ones, as they did not wish to be taken from the home of their fathers, determined to reform. Gathering together their money they bought 210 acres of land, divided it among themselves according to the amount of money furnished by each, and have been steadily improving it. They have also improved in morals until they are now the most civilized and prosperous band of the whole tribe. Their village fronts the water and the houses are on one street, which is straight and presents quite a neat appearance. This is the home of the head chief of the tribe, and they have a school, church, and jail. They gain their living by agriculture and by working and canoeing for the neighboring farmers.

(8) Eighteen miles farther west is Port Angeles, where there are about thirty-five Indians nominally resident. Many years ago the United States custom-house was at this place, work abundant, and the Indian village lively; but the custom-house was afterwards removed to Port Townsend, the whites left, and employment became scarce. Many of them live at other places a good share of the year, and when at home they make some money by canoeing for the few whites to Dungineas, Port Discovery, Port Townsend, and Victoria.

(9) Eight miles west of them is Elkwa, Elwhah, or Elwah, a village of seventy-five. These once formed a very strong band of the tribe, being almost independent of the others, but they are not so now. They live largely on fish, but canoe considerably to Victoria and Dungineas for the few whites near them, and some of them spend considerable time at other places working, and go to the Makah waters for seals. Three men here and one at Port Angeles have taken homesteads a mile or two back from the salt water, and are the only members of the tribe who live so far away from it.

(10) Thirty miles farther west is Pisht, with thirty Indians.

(11) Ten miles still farther west are Klallam Bay and Hoko, with forty more. These live more on fish and after the old Indian style than the rest of the tribe. They, however, canoe and seal some and gather salmon and halibut for a cannery recently established there. I can learn of only two dialects spoken by this tribe; the Elkwas and those west of them being said to speak as if with thicker tongues than those east of them, and so to pronounce some words somewhat differently.

The vocabulary which I have obtained is from the eastern members of the tribe, but I do not understand that there is enough difference to make it advisable to do anything with the other.

Besides the Indians just mentioned there are about seventy-five more in various places who properly belong to the tribe. Many of these are now on the northern side of the Straits of Fuca, in British Columbia.

The three tribes here spoken of are so nearly alike in their manners and customs that I have thought it best to describe them together, simply noticing the points in which they differ. To have described them separately would have involved much useless repetition.

The Klallams believe that they were all, except the Chemakums, created where they now are; and also that nearly all other tribes and nations were created each one where it now lives. They have no reliable knowledge of their own history earlier than the recollections of the oldest Indian.

In obtaining their names for various articles I have often found that persons of eighteen or even twenty-five years of age do not know the names for stone arrow-heads, axes, chisels, anchors, rain-stones, and the like, which went out of use soon after the whites came. This shows how quickly the past is forgotten with them. The following stories were mostly written for me by a Twana school-boy, as they were told him by his father:

"*Queen North and the Colcine Indians.*—While the Colcine Indians were at peace in their habitations, a girl went out and looked into a house and saw many of their enemies (in her mind) getting ready to go into every house of the Colcines. She returned and told her master's family, but they would not believe her. The same day a boy went to get some water; when he looked into the water he saw some shadows, which were smiling, and these were the Queen North Indians; so he went home in haste to tell his parents, but they would not believe him. The girl took one of her master's sons and hid in the woods. Hence these Indians were not afraid, and so were all killed, except the girl, the little boy, and one man, for the Queen North Indians went into every house and slew the Colcines. One man took his small babe and ran away. His enemies pursued him, and when he saw they were about to overtake him he laid down his child and began to swim the bay. The Queen North Indians knew that they could not swim after the man, so they took his child and cut it in pieces. When the girl came back she found her master dead, because he would not believe her."

"*The Victoria Indians and two families.*—Two families were travelling together, and at night they lodged. While they were there some one shot from the woods, and when they looked they saw some Indians. One family went off as fast as they could, but the other had left their child near a log. The Victoria Indians took him, but his father got ready and fired at them, and they restored the child. My father thought that if they should shoot at their enemies they would think them brave and be afraid. The child that was taken captive is still living, and the daughter of the brave man is also alive."

"*Queen North again.*—After the battle the Colcines went out to search for their enemies, whom at last they found. Then they made a great shelf over their own beds. Their enemies came and were placed under the shelf, and one of them took a wife from the daughters of the Colcines. After a long time they laid themselves down on their beds, and the Colcines cut the ropes which held up the shelf. It fell down on the heads of the Queen North Indians, and none of them escaped. Once the Colcines bored some holes in the bottom of their canoes when their enemies came to see them. As they went home the Colcines started to take them across the bay. When they were in the middle of the bay they took out the sticks, the water came into the canoes and filled them. The Queen North Indians were drowned, but the Colcines were saved, because their neighbors went to them and helped them. So the Colcines prevailed over their enemies, and there was peace."

"*Story of another family.*—There was a man with his wife and children. One woman, who was very fair, was walking with a babe and some boys and girls. This was the daughter of the sick man, but when she came home she found some other Indians slaying the family, and her father was killed. These took hold of her; one wanted her, another wanted her, and all wanted her, and so they killed her, and none had her. The man's wife dug deep in the ground, put one of her daughters there and covered her over; she did also the same for herself, and another person climbed a tree, and none saw her, so three were left alive. The man was sick, and yet they showed him no mercy."

"*A fight with a grizzly bear.*—A long time ago a man came to the canal to marry a wife. He found one, and gave some things to her father. The woman loved the man, but her father did not like his son-in-law, but threw away the things which the man gave him, hence the man went home. After awhile this woman and some others went to gather berries. My mother's mother was among them. The woman had a companion, and the two went away from their comrades where they saw the bear, but they did not fear it, they simply talked about it, and made fun. The bear went off, but after a time they saw it again, when they talked just as at first. The bear went around to the woman who wished to marry the man and suddenly jumped at her. The other woman went to help her, but soon received some wounds, so that she left and went to tell her other comrades, while the woman kept fighting with the bear. Poor woman! She called aloud to her companions to help her, but they ran home to tell the news. She was soon killed, but her friends told her parents, and that night very many people gathered together with spears, arrows, and knives to fight the bear. When they reached the place they told the woman's parents to stand on a fallen tree, so that they would be safe. Then they surrounded the bear and had a great fight. They shot the bear and wounded her on each side, but after a while she ran away and they ran after her. But after a time they had no more arrows or spears, with the exception of two or three young men, who still followed her. When they reached a muddy place the bear stood on her hind legs and danced. The young men became frightened and ran back. When they looked at the dead woman they found very many wounds in her."

NOTE.—Thus far I have given the stories just as they were written for me by the school-boy. The last one I presume is true in the main, as I have heard it from several parties.

The Twanas relate that a long time ago they were camped in a scattered condition on Hood's Canal, nearly 10 miles south of Seabeck. The Klallams came and killed those farthest north, taking some girls captives. Those farthest south were afraid, and some wished to flee, but others said no. The Clallams, however, did not come to them, but returned. Four or five captives were taken.

*History by the whites.**—George Gibbs says the first visit by the whites of which we have any knowledge was in 1789, by Captain Hendrick, of the *Washington*, or in 1790 by Lieutenant Quimper, Spanish, in the *Princess Royal*. They came as far as Dungeness. Two other vessels came a year or a year and a half later, but they did not go above Port Discovery. In 1792 came Vancouver, who gives the first account extant of these Indians. He visited the three tribes, Skokomish (Twana), Tsemakumg, and Klallams, and was probably the first who ascended Hood's Canal. After that, until within about thirty years, the greater part of their intercourse was with the Hudson Bay Company, who had no fort in their land, though it had one to the north at Victoria and another to the east at Nisqually. During these thirty years the Americans have supplanted the British traders. We have erected saw-mills, stores, and towns, and have cultivated farms in the midst of these Indians.

In 1855-'56 the Indians on the eastern part of the sound were engaged in war with the whites, but neither of these tribes, as tribes, engaged in it, and they have never been at war with us. A few of the Twanas crossed the sound and joined the other Indians in that war, but white men lived among the Twanas during the whole war in safety. January 26, 1855, a treaty was made with the three tribes at Point No Point, which was ratified by the Senate March 8, 1859, and proclaimed by the President on the 29th of the following April.

The Indians chose a place near the mouth of the Skokomish River in the Twana land for their reservation. By the terms of the treaty a blacksmith, carpenter, farmer, physician, and school-teacher, with annuity goods, were to be furnished them for twenty years. An agent or sub-agent has also been furnished to them. The first agents were appointed under the political plan, which lasted until 1869, when the military took charge for about a year, and then another political agent was appointed. In 1871, under General Grant's religious or peace policy, the nomination of the agent was assigned to the American Missionary Association, since which time there has been no change.

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*Vol. I, Contribution North American Ethnology.

The census for 1878, the last full one taken, gives their population as follows:

Twanas: Men 68, women 84, children 78, unknown 20; total, 250.
Klallams: Men 149, women 171, children 147, unknown 80; total, 597.
Chemakums: Men 5, women 4, children 4; total, 13.
Total of three tribes, 800.

Gibbs, in the volume of North American Ethnology already referred to, gives as the census for 1852, or thereabouts, Twanas 290, Chemakums 90, and Klallams 926; total, 1,306. I have some reasons for thinking his estimate too low.

Mr. H. C. Hale, whose father was for a time superintendent of Indian affairs in this Territory, has informed me that he at one time, many years ago, soon after the treaty was made, issued rations to twenty-eight hundred Indians at this agency; but probably there were more present than belonged to the three tribes, as other Indians would be likely to come at such a time. Again, I get no estimate from any old settler that there were less than two and a half times as many twenty years ago as now, and some estimate them at five times as many then as now.

A census of the Indians is very difficult to obtain, and this may be one reason why Gibbs placed them so low. In the winter of 1877–'78 the agent traveled from Skokomish to Elkwa and obtained the names of four hundred and fifteen Klallams between Seabeck and Hoko, and estimated that there were one hundred more of them on the British Columbia side. Two months later I was at Dungeness to observe a potlatch, where every village of the tribe was well represented, and obtained the names of about forty-five more, and most of these lived between Elkwa and Hoko, in the region where the agent had not traveled. The Elkwa Indians, although living not more than 40 miles from the most distant of these tribes, had failed to remember many of them.

I see no reason why the country might not have supported a large number of Indians, for while they get quite a share of their living from the waters of the sound now, the whites are exporting to California and other places salmon, halibut, and clams from their waters.

Mr. Finlayson, of the Hudson Bay Company, made a count of the Klallams in 1845 and ascertained their number to be 1,760.

Gibbs* (1852–1855) gives 926 Klallams, 90 Chemakums, and 290 Twanas. In 1870 a census was taken by the Indian Department which gives the names of 194 men, Klallams and Chemakums, 233 women, 97 boys, 81 girls, 15 infants, unknown 11; total, 631. Twenty-seven of these were Chemakums, 291 Twanas.

These Indians have undoubtedly decreased greatly since their first intercourse with the whites. The Klallams and Chemakums have decreased more rapidly than the Twanas. An accurate census of the Twanas in 1875 gave 259 in all the families which I am now able accurately to trace. In 1879 there were in the same families 239 persons.

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*Cont. to North American Ethnology, vol. 1, p. 183.

Until within a few years intemperance has been one of the greatest foes to the lives of these Indians. The Klallam head chief has said that five hundred Indians have been killed by the saloons of Dungeness within twenty years. This is probably an exaggeration, but not a very wide one. The diseases consequent upon licentiousness and consumption have caused the death of many. At a very early day, too, smallpox undoubtedly worked great destruction, and whooping cough and measles have made havoc among the children. All of these diseases except consumption were introduced by the whites.

As the subject of the increase and decrease of the Indians has been quite widely discussed of late, I submit the following suggestions: On the first contact with the whites they decrease, but if the tribes are large and keep together somewhat compactly, and there is comparatively little intercourse with the whites, except on the outer edge, and wholesome efforts are made to civilize them, they do not diminish rapidly, and when somewhat civilized they begin to increase, as Drs. Riggs and Williamson, of Dakota, state. But where the tribes are small and the intercourse with worthless whites is considerable their decrease is rapid, and sometimes a tribe will become extinct before it has time to rally. This has been the case with the Chemakums.

Progress.—This has not been uniform in all localities and with all classes, those on the reservation and near the whites having progressed the most, while in the most favored places the older Indians have not changed much. As a whole, these tribes may now be called more than half civilized. The Twanas have progressed more than the Klallams, chiefly because they have had more instruction and help from the Government; yet, many of the latter tribe have made as strong individual efforts as their more fortunate brethren to improve their condition.

In regard to food, the estimate of the agent for 1878 is that 75 per cent. is obtained by Indian labor in civilized pursuits and 25 by hunting, fishing, and by gathering roots and berries. The Twanas generally have tables and some have table-cloths.

I was lately present at one feast where tables, white table-cloths, chairs, dishes, and civilized food had entirely superseded the old style equipments and provisions. On the 1st of July, 1878, they prepared a long table out-doors, with seats and a stove near by to warm tea, coffee, etc., with a full supply of dishes and food, much the same as the whites on this coast would have done at a feast.

Many have abandoned the old way of smoking the salmon, their native food, and have adopted the American style of salting it. Potatoes, flour, and sugar are almost as indispensable to them as to the whites, while they also purchase pork and beef, rice, beans, coffee, tea, butter, yeast-powders, saleratus, salt, lard, spices, sirup, dried and green apples, crackers, cherries, and pears; and raise in their gardens corn, peas, beans, onions, turnips, beets, carrots, parsnips, cabbages, and raspberries.

Medicines.—They are slow to use the white man's medicine (although on the reservation they are furnished free of charge), often preferring their old remedies in slight cases of illness, and in severe cases their tamanous. If a medicine cures quickly they like it; but if after a few days they are not well, they abandon it. Those who live off the reservation seldom have any treatment except in the old style.

Houses.—Most of the Twanas and a large number of the Klallams east of Port Angeles build their houses in the style of the whites, with floors and stoves or fire-places, and often their houses have two or three rooms. These now dislike the ground and dirt floor, the smoke and the communal room. Some of the women regularly wash their floors, but with the majority there is room for improvement in this respect. The rooms have been almost entirely changed from the old one-sided shed style of long boards to two-sided roofs of shakes or shingles. Whenever they can they buy sawed lumber, locks, and windows. Brooms, chairs, and benches are in common use. It seems still, however, somewhat difficult for many of the women to sit on chairs when sewing; they then prefer a mat on the floor. Many have some kind of civilized bedstead, but there are still a large number of the old-fashioned kind fastened to the wall all around the room. Carpets or rugs are very scarce. Mats, baskets, and ladles are in common use, and still manufactured, but are steadily yielding to American articles for similar purposes, while dishes, knives, forks, cups, lamps, and buckets are used by a large number. When they are logging they live very nearly as well as their white neighbors in the same business.

Clothes.—I have never seen one of these Indians dressed in the old native style, but there are some of the older ones and those more remote from the towns who wrap themselves in a blanket when at home, only putting on their civilized clothes when going abroad. This is more common among the Clallams than among the Twanas. On the Sabbath and on public occasions they appear well dressed, mostly clean, and some quite tastily robed. At such times hats, linen coats, white shirts, broadcloth coats, woolen and calico dresses and good shawls are common. The only exceptions in respect to dress reform are among the women, who have been slow to adopt shoes, and still seldom wear any head covering, except a shawl. The ornaments formerly worn in the nose have been entirely abandoned. Other ornaments, such as finger-rings, ear-pendants, bracelets, and the like, except among the aged and conservative, are mostly purchased of the whites. Tattooing is going out of practice, many of the older Indians being ashamed of the figures on themselves. Painting of the face is not common, except at the tamanous feasts and potlatches, and sometimes when gambling. Mirrors, brushes, combs, and soap of American manufacture are commonly in use.

Implements.—The native articles for general use, war and the chase, fire-making, building, and agriculture are almost entirely abandoned, and those of civilized make have taken their places. In fishing they use many of the old style articles, as they see no advantage in giving them up; but when they see something that is an improvement and they can obtain it, they are not slow to do so.. Native tools for leather-working and working fiber are more common than American ones, but knitting, carding wool, and sewing are entirely reformed. Paints and ropes are mostly American.

Travelling.—They cling to their canoes, for they are lighter and swifter than American boats.

American standards are used in measuring and valuing. Their music is mostly native, and so their art-work.*

Social customs.—Most of the Twanas under forty years have been married in our style as well as theirs, but none of the Klallams, except those who are land owners, as otherwise the property would not descend to their children. Permanent marriages is becoming quite common, and polygamy is dying out. New polygamous marriages are not allowed, and there are but ten men in both tribes who have more than one wife each. Slavery is dead. Potlatches are said to be growing somewhat less frequent than formerly, some having abandoned them entirely. The custom, though, has a strong hold on the northern Klallams. The majority of the able-bodied men among the Twanas and those of the Klallams who live at Seabeck, Port Gamble, Port Discovery, and around Jamestown, and a few others are engaged in civilized labor, the Twanas being occupied as farmers, loggers, and day laborers, and the Klallams mainly in saw-mills and as day laborers. They raised in 1878 1,125 bushels of vegetables, 120 tons of hay, and 20 bushels of grain; cut 100 cords of wood; owned 72 horses and 68 cattle, and cultivated 150 acres of land—an increase over 1872 of 900 bushels of vegetables, 30 tons of hay, and 18 cattle, and a decrease of 30 bushels of grain and 28 horses. Their principal crops are hay and potatoes.

In 1878 a number of them voluntarily gave a day's work each as their contribution to the road taxes of the country. Children are cradled mainly in the old style, but the custom of flattening the head is dying out.

Morals.—There is progress here, but it is slow. There is very little theft among the Twanas, more among the Klallams, but not a large amount. Falsehood and profanity are common, and it is difficult to induce them to abandon either. In regard to chastity they also improve.

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* For Gambling and Language, see *post*, pp. 647 and 652.

Murder is rare. Parental and filial love are quite strong, and the poor are generally cared for by their relations and friends.

SURROUNDINGS.

Outline and size of Territory, elevation, and water systems.—Reservation near the head of Hood's Canal on Puget Sound in Washington Territory, and at the mouth of the Skokomish River. It is nearly square, and comprises about 5,000 acres; two-thirds of it but a few feet above tide-water, the other third mountainous and several hundred feet high. The Skokomish is the only river which, coming from the north in the Olympic range of mountains, flows east on the south side of the reservation and north on the east side, when it empties into Hood's Canal. There are several sloughs running from the river to the canal across the reservation.

Geological environment, both stratigraphical and economic.—The stratigraphical environment has not been thoroughly studied. Both lava and granite evidently lie at the bottom; the granite I think to be the oldest. Since the granite, evidently there has been a long washing either by salt water or fresh, I do not know which, but presume it was salt, as the upland is mostly a gravel-bed. As the sea then went down, the river formed most of the soil good for cultivation.

Economic condition.—The soil of about two-fifths of the reservation is black rich bottom land, very excellent for cultivation when cleared of the timber which covered it. One-fifth of the land is swampy, and 1,800 acres, nearly two-fifths, is gravelly and covered with fir timber and is almost useless except as timber land.

Climate.—Chiefly a dry and wet season as in western Washington and Oregon, but little snow and cold weather generally during the winter, but a large amount of rain, which continues at intervals during the summer. The spring is generally backward, as the Olympic Mountains, some of which are snow-capped during the summer, are but 20 miles distant to the north Frosts in the fall, generally not early, coming from the 1st to the 25th of October usually.*

The following is a list of the mineral substances which are of practical value to them; they are, as far as I know, fourteen in number, besides the soil for cultivation.

I am indebted to Prof. T. Condon, of the Oregon State University, for many of these named:

Agate is used for arrow-heads; basalt for the same and for hammers; beach stones for anchors, hammers, sinkers in fishing, and for slinging and tanning stones; black mud of salt marshes for dyeing; chalcedony for arrow-heads; clay stones for pipes and rain stones; clay of a red and a clay color for paints; jasper for arrow-heads; metamorphic stones for axes and adzes; quartzite for hammers and whetstones; sedimentary rock for hammers; slate for knives, and trap rock for hammers and tanning stones.

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*Eells on Twanas, p. 61.

PLANTS.

The following fifty varieties of native plants are of practical use, besides cultivated plants and grasses for stock:

Alder.—The wood is used for fire-wood and for making dishes, plates, ladles, bailers, and masks, and for the building of fish-traps and rough houses. The bark is used for medicine, strings, ropes, and dyeing.

Barberry.—The bark is used for medicine.

Blackberry.—The berry is used for food, the juice for paint, the young leaves for tea, and the roots for medicine.

Cat-tail rush.—The blades for making one kind of baskets and partly in making several other kinds; for mats, which are among their most useful articles, and for strings and ropes. The head was formerly used in making blankets.

Cedar.—This is the most useful vegetable production of their country, its woods being used for planks for houses, burial inclosures, and the like; for canoes, oars, baby-boards, buoys, spinning-wheels, boxes, torches, arrow-shafts, rails, shingles, fish-traps, tamanous sticks, and fire-wood. The limbs for baskets and ropes; the bark for baskets, mats, sails, baby-head covers, springs, bailers, women's skirts, and, when beaten, beds for infants, wadding to guns, napkins, head bands, blankets, and for gambling purposes; the gum and leaves for medicine.

Cherry.—The bark is used for strings and medicine.

Cottonwood.—The wood is useful for fire-wood, the bark for medicine and strings, and the buds for medicine.

Cranberry.—The berry is employed for food, the juice for paint, and the young leaves for tea.

Crab apple.—The wood is used for wedges, hoes, and fire-wood; the fruit for food, and the bark for medicine.

Currant.—The berry for food.

Dogwood.—The wood is manufactured into gambling disks and hollow rattles, and is used for fuel.

Elder.—The wood is made into arrow-heads, used as playthings; the bark used for medicine, and the berry for food.

Fir (*red*).—The wood is valuable for fire-wood, boards, masts, spear-handles, spits, and oars; the bark is preferred to everything else for fire-wood, as it is often 2 or 3 inches thick and pitchy. The pitch wood is good for torches, fire-pots, and kindlings, and for the latter use it is sold to the whites. The pitch is used for fastening on arrow-heads and spear-heads, and as a cement.

Gooseberry (*two varieties*).—The berry is used for food and the juice for paint.

Grass, specific name unknown, is used extensively in making and ornamenting baskets of several kinds.

Hazel.—The nuts used for food, the wood for rims for snow-shoes, nets, and the like, and the bark for strings.

Hemlock.—The wood serves for fire-wood and halibut hooks, the leaves for tea, and the branches for covers in steaming food.

Huckleberry (*black*).—The berry is used for food and the juice for paint.

Huckleberry (*blue*).—Same purpose.

Huckleberry (*red*).—Same purpose.

Ironwood.—The wood is used for arrow-shafts, arrow and spear heads, and mat needles, and the bark for medicine.

Indian onion.—The bulb is eaten.

Kelp.—Strings and ropes are made from the root.

Kamast.—The root is edible.

Laurel.—This is used for making spoons, vessels, and fancy work, as it is easily carved; the leaves are medicinal.

Licorice.—The root is used for medicine.

Maple.—The wood is utilized for hacklers, mat-blocks, paddle oars, bobbins, and blocks for making seines, combs, fish and duck spear-heads, fish clubs, rails, and fire-wood. The leaves are used in steaming.

Maple (*small variety*).—The wood for fire-wood.

Moss is used for wrapping around wood while steaming it to make bows, the whole being buried in the ground.

Nettle, used for making strings.

Oregon grape, barberry (?).—The root and bark are valuable for medicine, the root for dyeing.

Raspberry.—The berries used for food and the juice for paint.

Rose.—The roots and leaves serve as medicine.

Rush (*round*).—For making mats.

Rush (*small*).—Roots for food.

Sallal berry.—The berry used for food, the juice for paint.

Salmon berry.—The berry and young shoots are eaten.

Skunk cabbage.—The leaves used as medicine and the roots for food.

Spruce.—The wood is carved and the leaves employed medicinally.

Strawberry.—The berry is gathered for food.

Thimble cap.—The berry and young shoots are good for food.

Vine maple.—The wood is burned for fuel.

Willow.—The wood is occasionally used for fire-wood and the bark for strings.

Yew.—Paddles, bows, and fish-clubs are made from this wood.

BEASTS.

Fifteen kinds of animals are useful to them, as follows:

Bear (*black*).—The flesh is used for food, the skins for robes and quivers, and the teeth for ornaments.

Bear (*grizzly*).—The skin is dressed for robes, but it is a scarce animal; supposed to be used by medicine men for making people sick.

Beaver.—The meat for food, the skins for furs, and the teeth employed in games.

Cat (*wild*).—The flesh is eaten; the skins are made into robes.

Dog (*common*) is of use for domestic purposes, hunting, and the like.

Dog (*wool*).—The hair used in making blankets. The breed now extinct.

Deer.—This is probably the most useful wild animal known to them. The flesh used for food, skins for robes, strings, fringes, moccasins, clothes, and shot-pouches. The fawn-skins are sometimes made into buoys, used in whaling. Formerly they made shirts, which answered the purposes of shields or suits of armor, out of buckskin. Of the sinews they make thread, and of the hoofs, rattles used in religious dances. The brains employed in tanning.

Elk.—The flesh serves for food; the skins for robes, shield-shirts, and when dressed, for strings and clothes; of the horns they make chisels, wedges, and paint.

Musk-rat.—The skins are used for furs, and the teeth they gamble with.

Otter.—The flesh is eaten.

Otter (*sea*).—The fur valuable.

Panther.—The skins are made into robes and clothes.

Raccoon.—The skin is used for furs, and the flesh for food; the bones for dishes and ladles.

Wolf.—The skin is used for robes, quivers, and caps.

The intestines of several of these are used for holding oil, and the bones for various articles, such as awls, arrow and spear heads, combs, fastenings, and the like.

BIRDS.

There are seventeen kinds of birds, which they utilize as follows:

Crane.—The flesh is used for food; the feathers for beds and pillows, and also for ornamenting the hair at festivals.

Ducks.—Seven varieties of these, viz: The mallard, pin-tail, scoter (?), wood-duck, teel, diver, and canvas-back, are used for food, and the feathers for the same purposes as the crane feathers.

Eagle.—The feathers are used for feathering arrows and in tamanous head-bands.

Grouse.—The flesh for food.

Goose.—The flesh for food.

Gull.—The flesh serves for food for old people occasionally, and the feathers for beds.

Hawk.—The feathers are worn in tamanous head-bands.

King-fisher.—A piece of the skin, where the tail or wing feathers enter it, was used in fishing attached to the line near the hook, as it was superstitiously supposed to attract fish.

Loon.—Two kinds, the light and dark, were used for food, and the feathers were made into beds.

Woodpecker (*red-headed*).—The feathers are employed for feathering arrows and in tamanous head-bands.

Pheasant.—The flesh is eaten.

FISH AND OTHER MARINE ANIMALS.

Five kinds of these are used as follows:

Abalone.—The shells for money and ornaments.

Clam.—Three kinds of clam are used for food, and the large shells as drinking dishes.

Cod-fish.—The flesh and eggs of two kinds are used for food.

Crab.—Two varieties are used for food.

Dog-fish.—Oil obtained from it; occasionally the flesh is eaten; the bones are used for ornaments, and a part of the skin as a substitute for sand-paper.

Dentalia.—The shells for money and ornaments.

Flounder.—Two varieties are used for food.

Halibut, herring, and mussels.—Also used as food.

Olivella.—The shells used for ornaments and sometimes money.

Oyster.—Food.

Porpoise.—Food and oil.

Salmon.—Five varieties, viz: Silver, dog, red, black, and hump-backed; both the eggs and flesh are used for food, and the eggs for bait.

Seal (*fur*).—Is highly esteemed.

Seal (*hair*).—Buoys used in whaling, small sacks, pouches, etc., are made from the skin; oil is made from the blubber, and the flesh is eaten.

Shark.—From this oil is obtained.

Smelt and sea-eggs.—Used as food.

Scallop.—The shells are used for rattles in tamanousing, and the flesh for food.

Skate and trout.—Food.

Whale furnishes food and oil, bones for war clubs, sinew for thread, and whale-bone for a part of the cod-fish hook.

Cuttle-fish.—Food.

SOCIAL CUSTOMS.

Travels.—These are confined chiefly to places where those reside among whom they inter-marry. A few however of each tribe have been on sailing vessels to California.

Commerce.—I have seen dishes made from the horn of the mountain sheep or goat, which are said to have come from the Stikine Indians of British Columbia, 600 or 800 miles to the north; baskets and pipes from the Klikitats of eastern Washington, 150 miles to the east; baskets from the Chehalis and Cowlitz Indians, 100 miles to the south; and baskets from the Quinaielt Indians, on the Pacific coast, 50 miles to the west. The articles from these distant tribes are, however, limited in number, but there is considerable traffic among Indians who live inside these limits. The distances spoken of above are in a direct line; the way by which the articles come is much farther.

The traffic with the northern nations is by water, and therefore over a more circuitous route than the traffic with other tribes, which is by land.

CULTURE.

Means of subsistence.—Food formerly consisted solely of fish, roots, berries, and game, the spontaneous products of land and water.

The fish and marine mammals formerly used are still eaten, and are of at least nineteen kinds, namely, two varieties of cod-fish, two of flounders, five of salmon, the silver, dog, red, black, and humpbacked, and one each of dog-fish, smelt, skates, hair-seal, trout, whale, halibut, herring, porpoise, and cuttle-fish. The dog-fish is used only occasionally when other food is scarce. The salmon, halibut, herring, and smelt are dried as well as eaten fresh, the salmon being split open and the backbone being taken out. The halibut is cut into strips, and the herring and smelt are dried whole. Salmon are now also sometimes salted. Besides the flesh of the dog-fish, porpoise, seal, and whale, the oil was formerly eaten. The eggs of the cod-fish and salmon are a luxury. The porpoise, from its resemblance to pork, is called Indian pork.

Ten kinds of shell-fish are used for food, four of them being different varieties of clams, two of crabs, and one each of oysters, mussels, sea eggs, and scallops, the latter two being found only in the Klallam waters. Clams alone are dried. In drying them the Indians first build a large fire, in which they heat a number of stones, and when the fire has nearly burned down, they remove the coals, pour on the clams, perhaps bushels of them, and cover the whole with several thicknesses of mats. They are thus steamed until they are cooked and opened, when they are taken from the shell, spitted on slender sticks 2 or 3 feet long, and put over fires in their houses to dry.

Fish eggs are dried by being placed on small wooden frames, a foot or two square, and placed over the fire. Salmon was formerly their staff of life, and their chief business in the summer was to dry it for winter. There are some kinds of fish in their waters all the year round, though some varieties they do not eat unless food is scarce.

Roots and branches.—The kamass was formerly the most prized, but as it does not grow in their land, having been imported from quite a distance, they seldom use it now.

The root of the skunk cabbage, steamed, the Indian onion, a kind of rush root, that of an unknown plant, and of fern were also eaten. The fern roots were dried, laid on a rock, beaten with a bone club into a kind of flour, which was mixed with fish eggs and made into a cake called by the Klallams skive-u.

The young shoots of the thimble-cap, salmon berry, and a plant, name unknown, were and are still eaten; of all these the kamass and fern cakes, as far as I know, were alone put up for future use; neither is now much used.

Wild fruits.—The blackberry, three kinds of huckleberry (black, red, and blue), sallal berry, cranberry, gooseberry, hazel-nut, salmon berry, strawberry, raspberry, crab-apple, currant, elderberry, and a small red berry from their tobacco plant, are all used for food. The blackberry, two varieties of huckleberry, and sallal berry are dried for storage, the first being often pounded up and made into cakes. Between the young shoots, roots, and fruits they have some kind of vegetable food most of the time.

Land mammals.—The beaver, black bear, deer, elk, otter, wild cat, raccoon, and mountain sheep were used for food, all except the mountain sheep and wild cat being still in use. When a bear is killed it is very common to invite friends and have a feast. The flesh of the deer, elk, and bear is dried.

The crane, grouse, goose, gull, light and dark loon, pheasant, and seven varieties of ducks, viz, the mallard, pin-tail, scoter, wood, teal, diver, and canvas-back, are eaten. The grouse and mallard duck were not eaten until the whites came; the mallard because it fed on snails. None of these were put up for future use, but now ducks are sometimes salted down by the barrel.

Salt was never used until the whites came, and even now they do not salt much of their food. There is no place in this region where salt can be obtained, except in the sea. They did not even have in their language a word for salt, though they had terms designating its quality and also one for salt water. I have occasionally seen them drink salt water with relish, and they may have thus satisfied the demands of nature.

Cooking.—Birds and oysters are now generally boiled. Young sprouts are eaten raw. Muscles are roasted in the fire. Fish, when eaten fresh, are boiled or roasted on spits before the fire. Other animal food is roasted on the spit, boiled, or steamed. Berries are eaten raw, stewed, and in pies. In steaming food in large quantities they follow much the same rules as when cooking and opening clams, but dry branches of trees are used in connection with the mats. Formerly in boiling they heated stones and placed them in water in their water-tight baskets.

Storing.—Cultivated roots when stored are commonly "cached" in the ground and covered with boards and earth, regular cellars being uncommon.

Drinks.—Tea and coffee are now very common, but when not able to obtain these they have occasionally made a tea from the leaves of the cranberry, blackberry, and hemlock. They use but little milk, for while they have some cows they think dairying too much trouble.

MEDICINES.

I have been unable to obtain a complete list, but give the following remedies, some of which were given in my article on the Twanas:

Alder-buds.—Used for colds and biliousness. They eat them and afterwards drink salt water as an emetic.

Alder bark.—This they grind in water and drink the infusion as a tonic.

Barberry bark is prepared in the same way as the last, and used to purify the blood.

Blackberry root is used for colds.

Cedar gum chewed for toothache.

Cedar leaves are chewed and bound on cuts.

Cherry bark prepared as alder bark for a physic and tonic.

Cottonwood bark, from the body of the tree, after having been soaked in salt water, is ground and used as a medicine.

Cottonwood buds are also used as a medicine.

Crab-apple bark.—A cold tea is made from this as a wash for the eyes.

Elder bark.—An infusion taken internally and in a vapor bath is used for diarrhœa.

Licorice.—Used for colds.

Oregon grape.—The root and bark are used in the same way as alder bark for skin diseases.

Rose bark and roots, used as medicine.

Potatoes, scraped, for burns and scalds.

Skunk cabbage leaves.—They heat rocks, throw water over them, place leaves on them, and get over the steam for strengthening general debility.

Earth is sometimes bound on bruises.

Cautery.—Rheumatism is sometimes treated by taking a red-hot iron, stick or small bunch of cedar bark, and burning the flesh to the bone.

Blood-letting is done by scarifying the body in various places.

HABITATIONS.

Dwellings.—Their houses are of nine kinds. The potlatch houses are the only public houses which they have. They are not constructed on a uniform plan. In the account of potlatches will be found a description of a house on the Skokomish Reservation and another at Dungeness. One built by the Twana Indians, ten years ago, was somewhat similar, to the one on the reservation, but was larger, being about 50 feet wide and 300 feet long. One at Port Angeles was also somewhat similar, and these were used very little as dwellings after the potlatch. Those at Sequin and Port Gamble are more nearly like the one at Dungeness, and have since been used as dwellings.

Sweat houses are very uncommon; the only ones which I have seen have been used by the medicine men. They are 3 or 4 feet in height and a little more in diameter, being conoidal. Sticks are driven into the ground near together, bent over, covered with large leaves, as those of the maple tree, and then covered with dirt. They are only intended for one person at a time.

Large dwelling houses.—These are usually 25 or 30 feet wide by 40 or 50 long, though occasionally they are made 80 or 100 feet long. They are each owned by one man, but intended for several families, usually his friends and relations, who pay no rent. There is no floor. The doors are either at each end or in the middle of one side, and inside the house there are small walls on each side of the entrance, similar to that in the potlatch house, to guard against the wind. Each corner is intended for one family, but sometimes more occupy it. On the inside, all around the building, there is a bed platform about 3½ feet wide and 2 feet high. A part of this is used for storing their effects. Underneath it, also, many things are kept. Below and in front of it is a low seat about 6 inches high and 3 feet wide, which is also sometimes used as a place for sleeping. The fire is on the ground in front of this and the smoke escapes by holes in the roof immediately over the fire and about 7 feet above the ground. Sticks are placed in various positions where food, especially fish and clams, are hung to dry. This class of houses is now used very little by the Twanas.

Flat-roofed dwelling-houses.—The sides of such houses are made both of upright and horizontal boards, and the roof is composed of two parts, that made of split cedar boards or clap-boards, which generally have a steep pitch, and another part made of long boards. Such a house is intended for only one or two families, and the inside arrangement is very similar to that of the large dwelling-house.

House with roof wholly on one side.—In this the roof is similar to that of the last. This is said to have been anciently the almost universal mode of building all permanent houses, and the boards for the roof were hollowed out. This form of house is now seldom used.

The Government houses.—These were built on the reservation for the Twanas by the Government carpenter, the Indians having been induced to use a part of their annuity money to purchase the lumber, and are now the dwellings most in use. A number of the Klallam Indians have also built similar structures for themselves. These houses are mostly 16 by 22 feet, with a shed kitchen 8 or 9 feet wide added on one side. Inside they are generally divided into a bed-room, sitting-room, and kitchen. Some of the rooms are papered and are furnished with beds, tables, chairs, benches, a cupboard, and a stove or two, and a few either have mats, a few rugs, or pieces of carpet on the floors. They have also clocks, dishes, looking-glasses, etc., and in one there is a bureau.

The mat house.—These are made of mats, and of late some boards are also used in their construction. They are intended as temporary houses and are generally put up at fishing places during the summer. Inside, the beds are laid around the side on boards a few inches from the ground. The fire is in the middle; most of the space overhead is occupied with fish which are being dried. People and things are stowed where any room can be found, and the whole atmosphere is filled with smoke.

The half-circle camp.—When traveling in stormy weather they often place poles in the ground in the form of a semicircle to the windward and fasten mats to them, the whole standing so as to answer both as wall and roof. Under this shelter they sleep. The fire is to the leeward, which is open.

Tents of cotton cloth are now often used in travelling, and sails are also spread over poles so as to form a kind of low tent.

Outbuildings.—These consist of barns, stables for horses, stables for oxen when they are logging, cellars and caches for roots (chiefly potatoes), woodsheds, which are also rather scarce. They often take their canoes into their large houses. These outhouses are all built after the style of those of the whites, though not usually as substantial. None of them were in use, as far as I know, before the coming of the whites. Their houses were originally near the beach in small villages, but arranged withno order. Those at Jamestown are now on one straight street and those on the reservation on their farms.

APPURTENANCES TO DWELLINGS.

Doors.—These are opened or closed by sliding boards over the aperture. At present all doors are made after the civilized style. Sometimes only mats are hung over the entrance.

Fire-places.—These are of five kinds, two of which are ancient and three modern. (1) Anciently the Klallams, at least, dug a place about a foot deep and 5 or 6 feet in diameter in some of their houses, heaping up the dirt around the edge. There are none of these now in use. (2) They build their fires on the ground without any preparation but a smoke-hole. This is usually about 3 feet square and often has a cover which may be used when a severe rain occurs or the occupants are absent. In the Government houses a hole is sometimes cut in the floor about 3 feet square; the space from the ground to the floor filled with earth, and perhaps the edges of the boards around the fire lined with tin. In the flat-roofed houses a board or two is removed at one end, or for the whole length, in order that the smoke may escape. A board chimney is sometimes used, which is the connecting link between the fire on the ground and our chimney. The hearth is of earth, the sides simply of boards nailed up. Its peculiarities are its size and material. It is built large for two reasons: First, that the boards may not take fire, and as an additional preventive sometimes an old piece of iron is placed against the sides of the chimney. Second, that the occupants, especially when sick, may lie inside the chimney near to the fire.

A common-sized chimney of sticks and dirt is sometimes built similar to those of the whites in the new settlement. Another form from the logging camps of the whites is a truncated pyramid placed so that the base, which is about 5 feet square, hangs some 5 feet above the fire and the smaller end passes through the roof. The draught through this is sufficient. Such a chimney is placed near the center of the room, so that occupants can gather around the fire.

Material for building in all permanent buildings is of wood, and of late years sawed boards are usually obtained. Barns are often sided with split cedar boards from 3 to 5 feet long, called roof-boards, clap-boards, or shakes. Formerly their large planks were split from cedar trees, and, as cedar decays slowly, this is still in use in many places. The largest I have seen were among the Klallams at Elkwa, and they were 2½ feet wide and 40 long, and 3½ wide and 20 long. These were split, and afterwards trimmed by hewing.

FURNITURE AND UTENSILS.

Mats.—These are of seven kinds. Three kinds are made of cat-tail rush. The plants are cut by the women in July and August, dried in the sun, and tied in bunches as large as can be comfortably carried. When a woman finds that she has time to make mats she assorts her rushes according to size into three lots. Of the largest rushes she makes the largest mats, about 5 feet wide; of rushes of medium length she forms mats about 3 feet wide, and of the smaller stalks she weaves mats about 2 feet wide. All these may be of any desired length. The largest mats are used chiefly for lining wooden houses and in constructing mat houses. Those of medium size are used at times for the same purpose, for the half-circle camps, for beds, pillows, seats, table covers, and as substitutes for umbrellas and oil-cloth, two layers forming an almost complete protection from the rain. The narrowest mats, usually from 3 to 4 feet long, are used mostly for cushions, as in canoes, and for the paddlers to kneel on. These cat-tail mats are thus made: The ends of the rushes are first fastened together in the shape of the mat, then strings made of the same material, shredded and twisted, are passed transversely through these rushes, and about 2½ inches apart. This is done with a needle of hard wood 3 feet long, half an inch wide, three-cornered, and with an eye in one end, in which the string is placed. After the string is passed through, a small piece of wood with a crease in it, is pressed over the mat where the strings are, to render it firm and of good shape. The edges of the mats are fastened by weaving the ends of the transverse threads firmly together.

Another mat is made and used in a manner similar to the medium-sized cat-tail mat, but it is made from a round rush which usually grows to a height only sufficient to make mats about 3 feet wide.

A rough mat is made from the inner bark of the cedar, split into strips half an inch wide or thereabouts and woven together at right angles. It is used chiefly to lay fish upon when they are cleaned.

A mat is also made from the inner bark of the cedar, which is split into strips a quarter or a third of an inch wide and woven in a manner similar to the last, but much more firmly and with more carefully finished edges. Sometimes a portion of the strips are colored black and woven in at regular distances, or else a border is made of the black strips. These mats are usually about 4 feet by 7 or 8, and were formerly used for sails, but are now used for house lining, matting, and to place food on at feasts.

Small table mats are also manufactured, much more as an article of commerce for the whites than for their own use.

Baskets.—These are of eleven kinds. They are woven and sewed, and are made of grass. They usually hold from a pint to a half bushel and are used for the following purposes:

(1) Carrying water and juicy berries, and formerly for cooking by placing heated stones in them.

(2) A stiff basket, but not water-tight, about the same size as the last, is made from nearly the same material, but not sewed. These are for more delicate use.

(3) Baskets made of cedar limbs split, the bark usually taken off, are woven. They hold commonly from a half bushel to a bushel. Those whose capacity is only a half bushel are ordinarily used for rough work, such as carrying fish, potatoes, clams, muscles, and roots. The upper loops are made also of cedar twigs twisted, and in these the carrying strap is fastened.

(4) The fancy basket is made of small grass and usually ornamented by figures. It holds from 2 quarts to 3 pecks, and is generally used by the women for storing clothes and fancy articles of the house.

(5) A basket made of a bush split and shaved on both sides. The pieces are a third or half an inch wide, and are woven together at right angles. It is used more by the whites than the Indians as a clothes basket, and seems a copy of some American baskets.

(6) Baskets made of the cat-tail woven, and usually holding about a bushel each. They are not durable and not much used, and chiefly for storing their effects.

(7) A large carrying basket somewhat angular and used in much the same way.

(8) Small baskets, usually holding not over 2 quarts; they are made of small grass, obtained by the Makahs, and used by women for holding sewing materials and similar small articles.

(9) Baskets made of the inner bark of the cedar, split into strips a half or third of an inch wide and woven. They are of various sizes, holding from 2 quarts to a bushel or more; used for storing purposes.

(10) Baskets made of some kind of grass, holding about a bushel, and really more of a sack than a basket; used as the last.

(11) Another similar to the last, but made of another kind of grass; also used for storing purposes.

Of these Nos. 1, 2, and 3 are common to these tribes, both in manufacture and use. Nos. 2, 4, and 6 I have only seen among the Twanas. No. 10 is made by the Quinaielt Indians, and is imported by the Twanas. No. 11 is made by the Klikitat Indians, and is also imported by the Twanas. I have never seen the Klikitat baskets among the Klallams or Chemakums.

Boxes.—I have only seen two kinds of boxes which are peculiar to these Indians. The water-box, which is made perfectly tight with the exception of a hole in the upper part, where the water is poured in, and the one from which it is poured out or drunk. The size of this is usually about 8 inches square and of the same length. This and the water-tight baskets are the only native water vessels, as far as I know. The box has the advantage of keeping out the dust. The second kind is used to keep shell money and small valuables. This consists of two parts—the box proper and the cover, which fits over it to the bottom. Such boxes were formerly made large enough to contain blankets. The construction of both of these boxes is similar and somewhat peculiar. The sides and ends are made of one board; where the corner is to be a small miter is cut, both on the inside and outside, partly through. Then the corners are steamed and bent at right angles, and the inside miter is cut so perfectly that it fits water-tight when the corners are bent. The corner where the two ends of the board meet are then fastened with wooden pegs driven in diagonally. The top and bottom of the box are fastened with pegs similarly inserted. (See Eell on the Twana Indians, p. 69.)

Dishes are used mainly for holding fish and seal oil. They are made of wood, alder being preferred. One made by the Indians of British Columbia, and which found its way among the Twanas, is made of the horn of the mountain sheep. There is no paint on it, but all the figures are made by carving, the darker shade representing the deeper cut. Some of these dishes were evidently made for holding food as well as oil. The intestines of seals, deer, and some other large animals are also sometimes used for holding oil. At present the Klallams chiefly use them.

The water-tight baskets already described were formerly used for stone boiling. Two kinds of spits are now in use for roasting. One is a simple straight stick, nearly round, half an inch or less in diameter, from 1 to 2½ feet long, and sharpened at both ends. By using several of these, some set at right angles to the others, a salmon is stretched out so as to be either dried or roasted. On a single one clams are impaled and dried, and smelt or other small fish are roasted. The other is a stick about three-fourths of an inch wide, 1¼ inches thick, and 3 or 3½ feet long, which is split for about 2 feet and then tied with grass to prevent its splitting further. The three ends are sharpened. On the two smaller ones the fish is fastened, and the other is stuck into the ground before the fire.

For serving and eating food, the following utensils are commonly employed:

Mats.—Some of these are often placed on the ground during feasts and the food placed on them, the guests seated on the ground on each side.

Baskets.—Berries are often served in the water-tight baskets.

Plates and troughs.—These are made of wood and are quite shallow. Alder wood is preferred. They are generally from 9 to 12 inches wide, and from 16 inches to 6 feet long and 10 inches wide. Of late years, since lumber has become common, troughs 6 inches wide and from 8 to 12 feet long are made of boards. They are for use during the large feasts, food being placed upon them. Rice, boiled fish, and semi-liquid food are now generally served from American kettles, plates, and pails.

Trays.—Occasionally trays are made. I have seen one 40 inches long, 25 wide, and 7 deep, and others smaller.

Ladles.—These are made both of wood (maple) and horn. These ladles are used for semi-liquid food; but are not always placed in the mouth, but near the mouth, and the food is pushed from them into the mouth with a small stick, or taken from them with a smaller ladle, which is placed in the mouth.

Stone dish.—The only stone dish I have seen was obtained from the Klallam Indians of Port Angeles. It is said to have been used for holding oil while eating it. It is a quarter of a sphere and quite regular. Another one was found while plowing at Port Angeles. It is a half-sphere, made of clay stone, and the Indians are not certain that it was ever used as a dish, as many similar ones are found at Klallam Bay. Its upper edge seems to have been trimmed for use.

Pipes.—The only two stone pipes which I have seen, appear to have been made from a soft grayish stone, perhaps clay stone.

I can not learn that pipes or narcotics were used by these Indians previous to the coming of the whites. When tobacco is scarce they often mix with it the leaves of a small bush which has a red berry, called *ska-wail-dai* by the Twanas; *ské-wad*, by the Skwaksins, and *stain-swot-man-ish*, by the Klallams. Tobacco is used by the majority of this people, but they are not as much addicted to it as some other Indians. I have seldom seen them chew it. The Twanas rarely smoke it except at some gatherings. The Klallams use it much more freely than the Twanas. I have never known of their smoking the pipe of peace.

Napkins are seldom used except at great feasts. One form is made of cedar bark, slightly beaten, about 2 feet long and tied into bunches an inch in diameter. I have seen also a piece of calico stretched by two individuals from end to end along a row of feasters, near their mouths, on which they wipe their hands and mouths when done eating.

Miscellaneous.—Fir pitch wood is generally used for torches, and when this is wanting, cedar is split somewhat fine and a handful of it lighted, but the lights of the whites have nearly taken the place of these rude lights, except for fishing and duck hunting night.

CLOTHING.

Hats.—A hat made by the Makahs, but which finds its way among the Twanas and Klallams, is water-tight and seems to be made in a manner somewhat similar to that of the water-tight baskets. Other hats somewhat like these, but with flat tops, are made by Indians of British Columbia and imported. None are made by the Twanas, Klallams, or Chemakums. They commonly go bareheaded.

Body clothing.—Pantaloons, shirts, and coats were formerly made of buckskin by these Indians, but are not now. The only buckskin clothes I have seen were imported from the Chehalis and Takania Indians. Short skirts for the women were made of cedar bark finely split and bound together at the upper edge where they were fastened around the waist.

Blankets.—Three kinds of blankets were formerly in use. One was made of dogs' hair, geese feathers, and the head of the cat-tail rush, twisted and woven together on a loom. A kind of dog, rather small, was kept specially for its hair, which was very long, and a woman's wealth was esteemed by the number of such dogs owned.

Another blanket was made by them from the inner bark of the cedar, slightly beaten and woven, the strings made of geese feathers. Skins were often used, especially those of the bear, deer, and wild cat, several of the latter being sewed together. Hardly any of these articles of native clothing are now worn, the civilized style being adopted.

Mat coats.—One kind of coat made of mats was short in front, extending only about as far as the elbows, but long behind, with a hole for the neck, it being put on over the head.

Arm clothing.—I have not been able to learn of any special covering for the arms, as some part of the body clothing already described would naturally extend over the arms.

Leg and foot clothing.—Moccasins were occasionally used, but the climate is too wet to admit of their being worn with comfort. They generally went barefooted, and the old ones still adhere to this custom.

Parts of dress.—A few women have of late learned to make lace from thread.

There is a native-made iron fastening for shawls and blankets. Such fastenings are also made in a little different shape and of brass and wood. Formerly they were made of bone. Fringes are appended to the leather coats, shirts, and pantaloons already mentioned. This is made of leather an inch or two long.

Receptacles for dress.—Baskets, described in the previous section, are all used for receiving clothing, except the eighth one mentioned, which is for thread and nicknacks.

PERSONAL ADORNMENT.

Tattooing.—In tattooing they use a needle and thread, blackening the thread with charcoal and drawing it under the skin as deeply as they can bear it.

Head ornaments.—Head-bands made of dentalium shell. Threads are run through the shells, then through the leathers which keep the shells in their places.

Ear pendants.—There are two kinds, one of dentalium shells, a number of which are fastened together in a bunch. Small pieces of black or red cloth are often fastened to the lower part of the shell for greater ornament. Another is made of abelone shells. Both of these were formerly used as money.

Neck ornaments.—Necklaces were formerly made by stringing both the dentales and olivella shells, but such are little used now. Sometimes these strings were 5 feet long, and were doubled several times. Beads of various colors, shapes, and sizes, some being very large, have now taken the place of shells. Blue ones are the most common, being preferred when the whites first came; but of late their taste is changing, and other colors are being used. Dog-fish bones and bears' claws were also strung for necklaces, the latter being used as charms.

Ornaments for the limbs.—Bracelets are made of washed iron and brass of native make, and of silver and other material made by the whites. I do not know that any were used previous to the coming of the whites.

Toilet articles.—Single wooden combs are common. I have seen only one double one; this was found on a grave at Elkwa, and the handle was partly gone, the whole being decayed. One was found near Port Angeles of horn.

WORKING IMPLEMENTS.

Knives.—A knife in very common use and of native make has the blade of steel and the handle bone. It is especially convenient in finishing canoes or anything hollow.

Another hunting-knife of native make has a double-edged steel blade, and the handle is of two pieces of bone rivetted around the steel, which extends beyond the handle.

Axes and adzes.—At present they use the American adzes and axes, with one exception. Stone axes belong to the archæology of the country. One of this class I have seen, which was obtained in a shell-bed at Dunginess among the Klallams. It was of metaphoric rock, three-fourths of a pound in weight, nine-sixteenths of an inch in thickness, and the edge is ground twice as much on the flat side as on the other. Another specimen found near the same place was of the same thickness; weight one-half pound, and the edge ground a little more on the flat side than on the other.

Some Indians say that these axes were used as hatchets or axes for ordinary chopping and there are trees near Dewater and Doswailopsh, on Hood's Canal in the Twana country, that have been partially or wholly cut by such axes. Others say they were used as hand adzes with which to finish canoes after they had been hollowed by burning. Such adzes are now in common use, only they are invariably made of old rasps and hafted with wood fastened together by a thong. All but one appear to be flattened at least on one side and some on both sides, and evidently intended to be hafted in that way. They are all well polished.

Wedges.—Large wedges were and are still made of wood. At present those of iron regularly made for the purpose, or old iron ax-heads, are very commonly used.

Chisels.—Those of American manufacture are now wholly used. I have seen only two of native make. Hammers of American make are also chiefly used, though occasionally stone tools are employed.

Implements of special use.—The number of stone axes, hammers, etc., which still remain among them show that some tools were used in their construction, but I have seen no such tools and heard of none, except that some say one stone was used to break, grind, and polish another. Their bone knives must have been used for making bows and arrows. There was but little need of implements for straightening arrows, as both cedar and iron-wood are naturally straight enough. For fastening the feathers and heads to the shafts a string of some thin bark like the hazel bark is used, and in securing the heads the string is covered with pitch of the red fir. Their fish-spear heads are fastened in the same way. The ends of the bows are bent by being wrapped in sea-weed or moss and buried in the warm ground very near the fire, where they steam, after which they are easily bent. Nettle strings and entrails of deer and the like, properly prepared, were used for bow-strings previous to the coming of the whites.

WEAPONS.

Striking arms.—Clubs were used for striking, especially when the Indians creep up by night in some stealthy way and surprise their enemies. One found near Dunginess had a whale-bone handle. The carvings are intended to represent the head of the thunder-bird, an emblem of power. Wooden clubs were also used.

Slings and shots or stones are used only by boys as playthings, and formerly by young men in killing ducks.

Fire-pots, filled with pitch wood, were formerly used to set houses on fire into which the enemy had fled. A part of the besieging force would attack one side of the house in order to draw the attention of the besieged away from the opposite side, when the party with these fire-pots would approach, set fire to the pitch wood, throw it on the roof, and as the besieged attempted to escape they were killed with spears, clubs, knives, or were shot.

Thrusting arms.—Spears for hunting ducks have usually a handle 15 or 20 feet long, and the prongs so far apart as not to injure the body of the bird. The teeth of the prongs are on the outside so as simply to catch in the feathers. These were formerly made both of bone and hard wood, but iron has been substituted for bone. A school-boy wrote me that ducks are caught with these spears at night by the light of a fire kindled in the back of the boat, which is generally occupied by two men, one to use the spear and the other to paddle. Geese and fish are also caught in the same way. Sometimes in foggy weather these Indians cover their canoes over with green boughs, among which they hide, then they paddle quietly among the ducks and shoot them.

Bows and arrows were formerly their only weapons of the projectile class, but they have been almost entirely superseded by guns. The shaft of the arrow is either cedar or iron-wood; of late many of the heads are made of wire of about three-sixteenths of an inch in diameter and 5 or 6 inches long. Chalcedony and basaltic rock were also used in their manufacture, but stone arrow-heads are very scarce. The Indians have a tradition that they were made by the wolf or panther while those beasts were men, before being metamorphosed by Dokibàtt. They also say that when broken into small pieces and shot at men or animals they are sure to cause death. This tradition, taken in connection with those of Dokibatt, is about all that seems to point to the existence of a race inhabiting this country previous to these Indians.

Armor.—The only bodily protection against the missiles of enemies of which I have heard is a kind of shirt made of dried buckskin covering the body.

FISHING IMPLEMENTS.

Spears and hooks.—Living as they do on Puget Sound, a great portion of their food has always been obtained from its water. The Klallams practice nearly all the methods which the Twanas have for catching fish, and also have some additional devices, as there are halibut, seal, and whale living in the waters of the lower sound which are not found in Hood's Canal. They have now adopted most of the methods practiced by the whites, especially the use of the hook and line. They buy hooks of European make, and also forge them from iron or steel. They have fish-spears made with three prongs, and sometimes with only two. The handles of such spears are usually of fir, it being both strong and straight, and the prongs are of some hard wood, as maple or iron. They are used for spearing flounders, crabs, salmon, and the like, and bringing up fish eggs. When doing so one person paddles while another uses the spear, and, because of long practice, they will see a fish partly buried in the mud, and having seen one, they hardly ever miss spearing it. There is a hook made of iron, but which is fastened to a pole 15 or 20 feet long by a thong or two. The end of the pole fits into a piece of wood which is fastened around the hook. By means of the pole the hook is moved around in the water and hooked into a fish, but when the fish is caught the pole is pulled out and the strain is on the thongs. The double herring spear or rake is made of wood, 15 or 20 feet long, with nails fastened into the lower end, usually only on one side, making a single herring spear, but occasionally on both sides. The nails are all sharpened. Another form of spear-head or native hook is worked in much the same way as the last. It consists of two spear-heads, the sharp point of each being of iron (formerly bone was used). This is fastened to two bones or pieces of hard wood by strings covered with pitch, and the whole is then fastened by strings or thongs to poles which also fit into the hooks.

There are several fishing implements used only by the Klallams, since the prey they are designed to capture, viz, halibut, whale, and seal, valuable for its furs, are not found in the Twana waters. One is a halibut hook made of a piece of bone and fastened by strings of cedar bark to a piece of hemlock wood bent by steaming to the required shape.

There is also a cod-fish hook. The head is of bone fastened with bark to a piece of whalebone. The bait, which is often a small fish, is slipped over the end; hence the necessity of a loop by which it is fastened to the line. The lines used with this hook are often of fine rootlets of the kelp, which when dry are brittle, but when wet are very strong.

These lines are used for various kinds of fishing by the Klallams, but are not used by the Twanas, as the kelp does not grow in their waters. Another, used for seal and whales, has a steel head which fits over a wooden handle to which it is fastened by thongs. The lower Klallams alone know the process of catching seal, and they have to go to the Makah waters for this purpose.

Traps and nets.—A way of taking salmon in rivers is to build a trap across the river. A number of small sticks three-fourths of an inch in diameter and 6½ feet long are fastened together 2 inches apart. Long sticks are placed across the stream and secured by braces. The small sticks or weir are placed so as to lean against these larger ones, the upper end slanting down-stream and tied to the poles; while for additional security the gravel of the bed of the river is shoveled on around the bottom of them. The weir prevents the fish from ascending the stream. Nets are then provided, about 6 feet broad and 2 feet deep, made of strings and secured to a rim of wood. Native strings of this sort are made of nettle or alder bark twisted, but American twine is now often used. During the day-time these nets are pulled up, but let down at night, when the fish are running, one man watching each net. The fish striving to ascend get into these nets, and their presence is immediately known by the moving of the string. The net is then pulled up, the fish killed with a club and laid on a platform. These clubs are often common sticks, but are sometimes fancifully carved. There are usually four nets let down at once to form the trap. Another trap is made in a similar way as regards the weir, but otherwise differing across the stream. Up-stream from the weir several pens are built, in which doors are made V-shaped, opening from below. The fish easily enter this, but, unable to find the way out, are speared.

Salmon in the salt water are also taken with seines, either bought or made by the Indians. In making them they wind the twine on a frame or bobbin of wood, which is open at the ends so as to receive the twine. The knots are tied over a block so as to secure interstices of uniform size. Another form of net, for gathering sea eggs and small fish, has a handle about 10 feet long and the rim of hoop-iron.

A sinker of stone is not manufactured, but a water-worn stone of the right kind is found on the beach and bark is fastened around it, to which the line is attached.

INDUSTRIAL PROCESSES.

Leather-working.—The deer or elk hide is soaked for two days and the hair removed by scraping it with a rough iron. It is then soaked a half day with the deer brains in hot water over the fire, the brains being rubbed over something like soap. It is then stretched and rubbed with rocks until it becomes soft and pliable, when they dig a hole in the ground, build a fire of rotten wood or cedar bark, stretch the skin over it and cover it with blankets, thus smoking it, after which it is fit for use. The stick on which the skin is placed to remove the hair is 4 inches in diameter, but on the under side about 1 inch is taken off. An irregular broken stone, fastened to a wooden handle, is used for rubbing the skin to render it pliable. The handle is about 3½ feet long. Sometimes, though, the stone is used without being fastened to a handle, being simply held in the hand. This one is about an inch thick.

Sticks of various kinds, and sometimes irons about 2 feet long, are used for digging roots, clams, etc.

Basket-working.—A bone implement is used for pressing the parts closely together in weaving baskets. Such tools are also made of hard wood. This and an awl for sewing the water-tight baskets are the only tools I have seen used in this work.

Implements for working fiber.—There is a wooden hand-spindle used now for making woolen yarn, but formerly for making yarn of other materials to be woven into blankets. This implement consists of a slender stick fixed in the center of a circular disk or wheel about one-fourth of an inch thick. The material to be spun is fastened to one end of the stick, the opposite end is taken in one hand and rolled over and over in the lap, while the other hand holds the yarn, which made in this way is very uneven. Occasionally very inferior yarn is made in this way by twisting the material with the hand on the lap. American cards are now used, and spinning-wheels have been introduced to some extent.

A loom secured to the ground by its pointed feet was formerly used in weaving blankets, but it is now occasionally used in weaving rugs.

Painting.—Before the introduction of American paints, black paint was made from coal, which is still used as a cheap paint, especially when painting the face; one kind of red paint was made from a red clay obtained by the Twanas about 6 miles below the reservation on the east side of the canal. There is a tradition about that clay as follows: "Long ago, before Dokibatt came, this bank was the Klikitat Indians and the opposite side of the canal was the Twanas. There was a gambling contest between the two tribes, and the Klikitats won the game. When Dokibatt came he changed them all to land. For this reason the Twanas use the red paint as a charm in dancing, gambling, and tamanous; for this reason also the Twanas are still beaten in such contests with other tribes; *i. e.*, once overcome, always overcome." Another red paint was made from the gnarls of a certain kind of tree found in the mountains; the wood passed through some kind of process under the ground.

The juice of berries is also sometimes used for painting faces.

A white or yellowish paint is said to have been made by burning elk horn, powdering it, and mixing it with oil. A clay-colored paint was made from a kind of earth in the Twana land. The Klallams obtain their red paint from a red clay in the Makah land; it is burned and mixed with dog-fish oil.

Dyes.—Cedar bark and grass is dyed black for ornamenting baskets by being buried in the black mud of the salt marsh for two days. To color the same yellow they are boiled with the bark of the root of the Oregon grape for a short time. To color them a deep red they are soaked with alder bark. Baskets are imported from the Makahs in which the grass is dyed purple, crimson, blue, and two shades of slate.

Sand-paper.—The skin of the dog-fish is used for this, and it is very serviceable.

Ropes and strings.—The largest ropes I have seen made by these Indians are of cedar twigs twisted in much the same style as our own hemp ropes, but they look coarser. These are very strong and lasting. The largest are made on the buoys employed in catching seal, and are three fourths of an inch in diameter. Some one-half inch in diameter are used for fastening canoes, and those three-sixteenths of an inch are utilized in fastening cross-pieces to canoes. Of braided cat-tail they make a flat rope, not very durable, about three-eighths of an inch thick by three-fourths of an inch broad, which is used for tying paddles into bundles, and of the beaten fiber of the same material twisted they make strings from an eighth to three-sixteenths of an inch thick, which are used in sewing mats together. They are not very strong, but for this purpose are good enough.

The ropes at the ends of the head-bands used in carrying baskets are made of the bark of the alder braided. They are about three-eighths of an inch thick and five-eighths broad. Of the inner bark of the alder split and twisted a kind of string is made which is manufactured into fishing nets. Another string one-sixteenth to one-eighth inch in diameter, also used in making nets, is made by hackling and twisting the outer fiber of the nettle. This is strong and looks much like linen twine. The Klallams make, without special preparation, lines out of the smaller part of the help root of about one-eighth inch diameter. When dry it is brittle, but when soaked a short time in water it becomes quite strong. Flat grass and strips of bark from an eighth to a half inch wide are also used in various ways, especially in making arrows and fishing implements.

Ropes used as hitching ropes, bridles, etc., for horses are made by braiding the long hairs from the horses' manes and tails. They are made about a half inch in diameter and are very strong and durable. Elk, deer, and other skins, both dried and tanned, are cut into thongs which are used for various purposes. Fibrous tissue from the deer, the elk, and the whale is used in sewing.

Other processes.—Obtaining oil from the liver of the dog-fish by boiling has become quite a business, as the oil is in demand by the loggers. Gathering oysters and clams, halibut and salmon for American canneries occupies a number. The Twanas are engaged in farming more than the Klallams and more in logging, but the latter work more in sawmills than the former.

LOCOMOTION AND TRANSPORTATION.

Travelling by water.—This is the chief mode of travel by these Indians, as their land is all situated on the shores of the sound, with its bays and inlets. The Klallams are more confined to it than the Twanas, owing to the mountainous character of their country, which makes it impracticable to visit by way of land any other Indians, while the Twanas are obliged to travel at least 10 miles southeast by land in order to reach the waters on which the Skwaksins live, and 30 or more to the south to reach the Chehalis Indians, with both of which tribes they have considerable intercourse. Trips to these tribes, and occasionally to Olympia and the Nisqually country, 40 miles to the southeast, together with their hunting excursions, constitute the sum of their land journeys. All other travel is by water. The Klallams own larger canoes and are better navigators than the Twanas, as they live nearer the mouth of the Straits of Fuca, where there is less protection from the ocean winds than in the Twana waters.

On January 30, 1878, I started with about sixty-five Twana Indians, in seven canoes, to attend a potlatch. We paddled until it began to rain, and also to blow favorably, so that nearly all, except those who steered, spent the time in trying to keep dry. A few had oil-cloth coats, a few umbrellas, but the most of them used their common mats, which are almost water-proof. It was rather comical to see a number of persons, mostly women and children, sitting in a canoe with a mat stretched over them, extending almost from one end of the canoe to the other. From a side view, only their heads were visible. Towards evening, after travelling seven and a half hours, and making a distance of 30 miles, we arrived at Seabeck. The next day it rained heavily until noon, and they decided not to start again on the voyage until the following day, as there was a head wind which would prevent their reaching a shelter before night, and moreover they did not wish to be the first at the potlatch. Some of them made a fire of pitch wood and cedar on a board, then putting their canoes on blocks, about a foot high, they placed the fire underneath, moving it along the whole length of the canoes, so as to burn off the moss and other material which might have accumulated on the outside of them, but not leaving the fire long enough in one place to burn the canoe. They do this to make the canoe run more easily. On Friday morning the messenger came to me at 7 o'clock, saying they were about to start. I hurriedly ate a part of my breakfast, and taking the remainder in my hand I started to their canoes. Four of them had gone, but the one in which I was travelling had not even been loaded. This it took them fifteen minutes to do. Then it was said one of the company was sick, so they stopped to tamanous over him, and it was half past 8 before we started. One more canoe, with ten persons, was here added to our company. The wind blew favorably and strongly, as much so as our crafts would bear. There was a fellow-feeling among all, for no single canoe of either set of four was allowed to be far away from the rest, for fear of some accident. If one could not keep up, the rest waited for it.

In eight hours we travelled about 35 miles, and arrived at some Indian houses, where all camped within 3 miles of Port Townsend. It had rained most of the day. We did not stop for dinner, but all ate a little dry lunch at noon. At morning and night they had warm meals. The next morning they had a short tamanous to obtain fair wind and weather. It consisted of singing, pounding on the drum, and on sticks. About 8 o'clock we started and reached Port Townsend in about an hour. Here they spent nearly two hours in purchasing things to present to the principal men at the potlatch, and the day being pleasant we went on, having a race in which nearly all the canoes took part. As there was little wind it was a trial of strength and endurance, and was engaged in for mere sport. It was kept up for 2 or 3 miles, until one canoe had passed all the rest and the losers were satisfied that it was useless to contest further. At about half past 5 we reached our destination, having made the entire trip in twenty-two traveling hours.

We set out on our return to Skokomish on the 11th of February at 11 o'clock. They intended to travel only 6 miles, camp at Sequim and visit these Indians, but the wind and weather proving favorable, they passed Sequim Bay without going into it, and encamped within 5 miles of Port Townsend. They would have gone farther, but the wind was blowing so strongly they were afraid to round Point Wilson, which is a dangerous place when the sea is rough. Here they camped out, away from houses, for the first time on the trip. This they often do in summer, but not so in winter if the women and children are along. It was a calm night, and they did not make much preparation for camping. Some slept in their canoes, but most of them lay on the ground, and some fixed up their sails and mats so as to shelter themselves from the wind.

The next morning I was up at 6 o'clock and called them, but they heard the wind blowing and thought it would not yet be safe to go around Point Wilson, so they did not get up, but in an hour it had calmed down and they concluded to start; fearing though that it would rise again (as it did soon after), they rose and started without any breakfast. Reaching Port Townsend they remained there until about noon. Then most of them went 3 miles farther and camped; but the owners of the smaller canoes feared to go across the bay, as it was very rough.

About 8 o'clock the following morning we again started and to shorten the distance some of our party took a route where we were obliged to make a short portage. Often in doing this, when there are but few persons along, they unload the canoes and take the articles and canoes separately across, but this time there were so many along that they were able to pull the loaded canoes across, having first laid down sticks over which they were dragged. During the day there was another race. We reached Port Gamble about 2 o'clock in the afternoon and some thought it best to proceed, but the Port Gamble Indians invited my companions to spend the night with them and partake of a small feast, which invitation they concluded to accept. The feast consisted chiefly of potatoes and rice, cooked in kettles, around which they sat, taking the food out with their large ladles. After dark the women assembled in one house and sat down in two rows opposite each other, singing for an hour or more, accompanied by the drum and the pounding of sticks. When this was over, two of the Port Gamble women made presents of from 5 to 12 yards of calico to each of Twana women, and after 10 o'clock some of the Twanas and Klallams began to gamble and kept up their game until 3 o'clock in the morning.

The next morning there was another feast of bread, crackers, and coffee, some of which was carried away. It was half past 10 o'clock before we left Port Gamble, hoping to reach Seabeck, 20 miles distant, by night. But soon after starting we met a strong head wind which grew stronger. Sometimes, especially in rounding small points, we used poles to push the canoes. The Indians seldom carry poles for this purpose, but generally use spears. About 3 o'clock in the afternoon the Indians got tired and encamped, only one canoe reaching Seabeck that night, and that was the one which belonged there. The rest were scattered, singly and in groups of from two to four, for a distance of about 4 miles, and were not together again after this; but the Indians were now in familiar waters and no longer felt uneasy concerning the safety of each other. I was camped with a party having four canoes. The wind blew violently that night, the trees constantly falling near us, and it rained so that it was almost impossible to make a fire. A few had tents, others used their sails as shelter, and the rest arranged their mats on poles placed in a slanting direction so as to keep off most of the rain and wind. About 3 o'clock the next morning an unusually high tide arose, covering all the beach where we were encamped, compelling us to leave. The water was from 6 to 12 inches deep in our camp before we could get our things into the canoes. So we went back to Seabeck for breakfast, reaching the place about 7 o'clock. It was a cold ride, as we were wet, and the wind blowing somewhat against us. We had to take turns at paddling, to prevent our suffering from cold. Other canoes came in later. Remaining here until half past 10 o'clock we again started, and though there was some head wind, we traveled 15 miles more before 5 o'clock, about which time we made camp. Six of our canoes were in company, the other having remained at Seabeck until the next day. That night I witnessed a silent tamanous over a sick woman.

We encamped on as high ground as we could find along the beach, but next morning about 4 o'clock the tide was so high as to compel us to run for fear of being again submerged. The water came only to the edge of our beds.

Some of the canoes started about 5 o'clock and with a fair wind part of the time they reached Skokomish about half past 10 o'clock. Others waited until after daylight and did not arrive until two or three hours later. Thirty-three hours were occupied in our return trip.

In July, 1876, I made another trip over the same route with these differences in circumstances: The latter trip was with one canoe and in the summer. With one man to steer, one to row, and two women to paddle, we left Skokomish about 6 o'clock in the morning and at 6 o'clock we camped on the beach without tents, having traveled 35 miles. The next day, the crew wishing to start early, I gave them permission, and we were off about 3 o'clock in the morning. They took a cold lunch at about 7 o'clock, and at 4 P. M. we were at Port Townsend, 35 miles from the last camp; but the wind was so strong around Point Wilson that they did not dare to venture there, although they were accustomed to the place, for they were Klallams and were at home in these waters. We were obliged, therefore, to remain at Port Townsend all day. The following day the wind died down and they wished to go, but as it was Sunday I forbade them; but on Monday, at 2 o'clock A. M., we continued our journey and arrived at Dunginess about 8 o'clock, having rowed 20 miles that day. We had no favorable wind during the whole trip and made 90 miles in thirty-one travelling hours, though there was little head wind to oppose us.

In returning we started at half past 4 o'clock, and were at Port Townsend by 10 o'clock, where we remained four hours and then set out for Port Gamble, which place we reached by half past 6 P. M. There we remained for the night with the Indians of that place. The next morning, on account of missionary work, we did not leave until 9 o'clock, and during the day we were detained about two hours in the same work, so that we traveled only 32 miles. The next day by 1 o'clock P. M. we reached home, 18 miles farther. Having had a favorable wind most of the time, we made the whole distance in twenty-three traveling hours.

The quickest trip I ever made in one of their canoes was 30 miles in five hours, before a strong wind, and with two sails a part of the time. But at last the wind was so strong we only dared to have one sail. At this time I had a good canoe and experienced navigators, or it would not have been safe. Few of the Twanas would have dared sail in such a wind.

In addition to the tamanous for wind, mentioned in the account of former trips, they would, especially in a calm, when they wished for a fair wind, pound on the canoe with their paddles or strike the water with them, spattering it forward. They also whistled for wind.

Canoes.—These are dug-outs made from cedar trees. In making them they formerly burnt them out, and finished them with the hand adzes of stone, but now they universally use American axes and adzes for the first part of the work and the hand adzes of rasp for the second part, although the finishing touch is put on sometimes with the curved knife. After this they are steamed, spread apart at the sides, and fastened with round cross-pieces or thwarts about an inch and a quarter in diameter. Holes bored through the ends of the cross-pieces and the sides of the canoe admit ropes of cedar which keep the cross-pieces in position. A rim or gunwale is often made for the upper edge of the canoe, about an inch in diameter, which can be replaced when worn out. Those in use are of three kinds. Large canoes, which are made chiefly by the Indians of British Columbia, and imported, are used very extensively by all the Indians on Puget Sound for carrying large loads and for dangerous travelling.

One that I saw was 35 feet long, 5 feet wide in the center, with a perpendicular height from the ground of 3 feet at one point, 2 feet 3 inches at another, 1 foot 10½ inches at another, and 4 feet 1 inch at the end. There were two places for masts, and a seat for the one who steers. The head of this kind of a canoe is a separate piece of wood. Such vessels are made both larger and smaller than this one, the largest I have known being the one exhibited at the Centennial Exhibition, which is 60 feet long and 8 feet wide. None as large as these are, however, owned by these Indians, but a few of the Klallams have some very large ones for whaling. The smallest I have seen was about 10 feet long.

Shovel canoes.—These are very scarce, even among the Twanas, and I have seen none of them among the Klallams. They are used in much the same manner as the next kind.

Small canoes.—These are very common, are made by both tribes entirely of one piece of wood, except that some have the movable rim mentioned, and are used for fishing, river travel, and even for going on the sound when it is calm and they wish to take only a small load. I have travelled 30 miles in this kind on the salt water, but we seldom venture far from shore.

Very few of these Indians own any skiffs or boats of American make, as their canoes are much lighter and easier for them to handle, and being accustomed to them from infancy they fear no danger, although a white person entering a small one for the first time is apt to be upset, and they have no keels.

Sometimes two of the large ones are fastened together side by side and covered with boards in order to carry a large amount of hay or ferry a horse for a long distance on the sound, but not for crossing rivers, as there are none in the country so wide that a horse can not swim across.

Poles.—In travelling against a strong wind, especially around points of land near shore where the water is shallow, or where ascending a swift shallow river, poles about 12 or 15 feet are often used very effectively for pushing; generally they are poles connected with the sail.

Paddles.—The most common form in use is a man's paddle and the woman's paddle, a little shorter in the blade and about an inch wider, as the stroke of the men is deep and long, and that of the women quick and more superficial. These are generally made of maple, but occasionally of yew.

The river paddle which is made by the Chehalis Indians and occasionally by the Twanas has the advantage that in rivers where logs are numerous the end fits onto the log and enables the rower to push the canoe where he can not paddle it.

Oars.—They knew nothing of these until the whites came. Rowlocks of either wood or iron are now fitted into most of the large canoes so that oars can be used, but paddles are also used in connection. In dangerous waters they lay aside the oars and use the paddles entirely. They often make oars of fir, sometimes of cedar, and sometimes purchase them made of hard wood. The small canoes are propelled exclusively with paddles.

Sails.—These are used with the larger sized canoes, and the largest often have two. Formerly the cedar-bark mats were used, but these have now entirely gone out of date, and those of cloth fastened and fashioned in shape and style by the American skiff sails have taken their place. Many sails are made entirely of flour sacks.

Rudders.—Very few canoes have rudders fitted to them according to the American style. Most Indians prefer the old way of steering with the paddle, for they can steer and paddle at the same time, and the shape of the stern of a canoe is not well adapted to a rudder. Usually the best paddle is used for this purpose. Formerly, when slaves were owned, it was the business of one of them to steer, for when the wind was fair the others could rest while he was compelled to remain at his post. Otherwise I have not been able to learn that there is or was any place of distinction observed by paddlers. Now the steerer is selected according to circumstances. If the water is rough and the paddling easy, the strongest person and best navigator steers, but if the rowing is hard the strongest persons are put at this work.

Anchors.—These were formerly made of stone, but now some kind of iron is used. Most of the smaller canoes have no anchors, being tied with ropes or hauled on shore.

Bailing vessels for canoes are of several kinds, sometimes carved out of alder wood and without handle. Some are made of cedar bark, the handle only being of wood. This is used but very little now. Often the water is bailed out with the hand, and old tin vessels of American manufacture are used.

TRAVELLING ON FOOT.

They generally travel only short distances on foot, seldom more than 10 miles, except in hunting. In coming to the Twana potlatch of 1878, however, the Quinaielt Indians came about 100 miles, chiefly on foot. In this short journey they often, the women especially, carry large loads. The way they usually prefer to do this is to take the carrying strap, tie the ends, which are several feet long, around the load, when it is of wood, mats, and such articles, or into the handles of baskets filled with potatoes, fish, apples, and other small objects. They then place the load on the back, and the flat part of the strap around the forehead. Formerly these straps were made of some tough bark, such as that of alder, braided. Now they use straps woven of strings and rags.

Snow-shoes.—These are very scarce and are not often used, except for hunting in the mountains in the winter, as the snow is not usually deep nor does it lie long on the shores of the sound.

Land conveyances.—Horses are used much more by the Twanas than by the Klallams, but so little by either tribe that they take very little pride in adorning their saddles and trappings. Common American or Spanish saddles are generally used; occasionally their horses shod. For some reason the word for horse, *ste-a-ké-o*, is evidently derived from the Nisqually word *stûk-ai-o*, meaning wolf, but from what resemblance to that animal I have never been able to learn. The same word, *stiakeo*, is found, as I am told, in the Chehalis language, and in all languages of the Sound except the Makah and the almost dead Chemakum.

MEASURES AND VALUES.

Counting.—The vocabularies for the first ten numerals of the Twana, Nasqually (Skwaksin dialect), Chemakum, and Klallam, are here given; to which for the sake of comparison are added those of the languages of several neighboring tribes which I have gathered from the members of these tribes who are either inter-married or have visited at Skokomish. These comprise most of the languages spoken on the Sound.

	Twana.	Nisqually.*	Snohomish.
1	Dá-kûs.	Dû-cho.	Dû-chi.
2	Es-sa-lĭ.	Tsá-lĭ.	Sá·lĭ.
3	Chó·ûs.	Klé hu.	Kló-hu.
4	Bú-sŭs.	Bos.	Bos.
5	Tsa-liwĕs.	Tsĭl·áts.	Tsĭl-áts.
6	I-a-pá-chĭ.	Dyĭl-á-chĭ.	I-láts and I-láchs.
7	Tu-kŏs.	Tsoks.	Tsoks.
8	Tŭ-ká-chĭ.	Tû-ká-chĭ.	Tû-ká-chĭ.
9	Hwáil-ĭ-a.	Hwail.	Hwûl.
10	Ó·pa-dĭch.	Pá-dats.	O-lob.

* The Skwaksin and Nisqually are identical in numerals.

	Chehalis.	Chinook jargon.	Kwi-nái-ĕlt.
1	Ót-sĕs.	Ikt.	Pau.
2	Sá-lĭ.	Măkst.	Sá-lĭ.
3	Chát-lĭ.	Klone.	Chát-la.
4	Mos.	Lăk-it.	Mos.
5	Tsi-lats.	Kwĭn-nûm.	Tsé-luks.
6	Tá-hûm.	Tá-hûm.	Sĭ-tûch-ĭ.
7	E-tsóps.	Sĭn-a-măskt.	Tsops.
8	Tsa-mos.	Stól-kĭn.	Tsa-mus.
9	Tó-hu.	Kwist.	Tûg′-wĭ-hu.
10	Pa-nats.	Tăt-hûn.	Pá·naks.

	Hoh.	Makah.	Kwĭl-lĭ-ut.
1	Lĭk^c.	Tsark wark.	Watch^e.
2	Klä-u.	Attl or ûtl.	Klä-hu.
3	Kwail.	Wi.	Kwä l.
4	Bái-yas.	Boh.	Bái-ĕs.
5	Tá-sl.	Shút-che.	Tahs.
6	Chi-tlás.	Che-patl.	Chĭt-láhs.
7	Kla-wak-tsĭs.	Atl-po.	Klä-wûk-ĕt-ses.
8	Kla-wĕ-tût.	A-tlĕs-sûb.	Kla-út-ûl.
9	Wetl-lûtl.	Sa-kwas-sûb.	Walt-ûl.
10	Chetl-tat.	Kluh.	Eks-chi-tûl.

	Kwil-lĭ-ut.*	Klallam.	Cowichan.
1	Welt.	Nût-sa.	Nût-sûs.
2	Klá-we.	Chĕs-sa.	I-sé-lĭ.
3	Kwá-lĭ.	Klé-hu.	Kle-hwûs.
4	Ma-es.	Nos.	Hûs-si·nûs.
5	Stäs.	Tl-káchs.	Tû·káts-ûs.
6	Chĭl-äs.	Tû-hûng.	Tû-hûm-mûs.
7	Kla-ók-us-ĕs.	Tsoks.	Tsáks-ûs.
8	Klau-ŭtl.	Tats.	Táts-ûs.
9	Wetl-tatl.	Tŭ'k-ho.	Tó-o-hwûs.
10	Kŭ-shetl.	Ó-pen.	O-pans.

*Given by another informant, and I presume fully as correct as the former one.

	Summi.	Skagit.	Chemakum.
1	Nût-sa.	Du-chȯ.	Kwetl.
2	Chĕs.	Sá-lĭ.	Klak-we.
3	Kli-hu.	Kli-hu.	Kwáil-lĭ.
4	Ngas.	Bos.	Me-és.
5	Tĭ-kach-es.	Sĭ-läts.	Chá-a.
6	T-hŭng.	I-läts.	Tsĭt-las.
7	Tsá-kwŭs.	Tsoks.	Tskol-kwûnt.
8	Tats.	Tŭ-há-chĭ.	Kwai-kwunt.
9	Tŭk-hu.	Hwûl.	Kwelts-hail.
10	A-pĕn.	O-lope.	Che-ta.

These languages are arranged in about the order in which the tribes speaking them live. In the Twana schûch-há-chĭ, and in the Nisqually ska sûk-a-chĭ means *hand*, hence we have from the same root, for *six* i-a pá-chĭ in the Twana, and dzil-á-chĭ in Nisqually, and a word for *six* of similar derivation may be found in the Snohomish, Skagit, and Kwinaielt; Tukachi, *eight*, from the same root, is found in Twana, Nisqually, Snohomish, and Skagit; kl-tats is the Klallam word for *hand*, and tats for *eight*, and this is found in the Cowichan of British Columbia and Sûm-mĭ, hul-kwunt is the Chemakum word for *fingers*, and it is seen as the origin of their words for *seven* and *eight*.

Sa-lĭ, *two*, runs with a little variation through the Twana, Nisqually, Snohomish, Chehalis, Kwinaielt, Cowichan, and Skagit, and an examination of vol. 1, Contributions to American Ethnology, pp. 262 and 280, shows that a similar sound is in the Shooswaap, Okinaken, Shwoyelpi, Skoyelpi, Spokan, Kullispelm, Cœur D'Alene, Flathead, Tait, and Kuwalitsk. The Hoh, Kwilliut, and Chemakum would would fall into a separate class in regard to this word.

Kle-hu-for, *three*, slightly varied, is in the Nisqually, Snohomish, Klallam, Cowichan, Summi, and Skagit, while in Major Powell's work, quoted above, the Tait and Kuwalitsk agree with them. In this word the Hoh, Kwil-li-ut, and Chemakum are again similar. The Chehalis and Kwinaielt also agree with one another, and in Major Powell's work the Shiwapmukh, Shooswaap, Nikutemukh, Okinaken, Wa ky-na-kaine, Shwoyelpia, Skotyelpi, Spokan, Piskwans, Kalispelm, Kulluspelm, Cœur D'Alene, Flathead, Silowab, and Ko-mookhs are similar.

The word for *four*, however, in slightly varied forms, easily traced, combines more of the languages given than any other numeral; baies, bu-sus, bos, boh, nos, mos, me-es, and similar variations are seen in all but the Chinook. It is the only numeral which connects the Makah with the others, and it shows relationship in all of the tongues, adding the Belhoota above, quoted from Major Powell's work, with the exception of the Silowat, Tait, and Kuwalitsk; in all, fifteen out of the eighteen dialects there given.

The Chinook is connected with the Chehalis only by the word for *six*. Singularly, the words for *one* and *ten* vary more than most of the others.

There had been considerable discussion as to whether words which sound alike show a similarity of origin in the tribes speaking them; but Prof. W. D. Whitney says that numerals and words indicating relationship are of more value as evidence on this point than any others. A further comparison of the four languages which accompany this shows that the Twana and Nisqually agree in many points, and the Klallam is similar to them in some, but the Chemakum, except in a few instances, is different from all the others, and these instances are such that the words may have been adopted from the Klallam, their neighbors. Dr. Gibbs* is doubtful whether the Chemakums ought to be included in the Selish family or not. There is no doubt but they are connected with the Hobs and Kwilliuts, judging from the numerals and their traditions.† Dr. Gibbs is also of this opinion.

In this connection I would say that a comparison of the manners and customs of all the above-named tribes, as far as I have been able to learn them, show that they are much the same, varying only as their different environments compel them.

Whether or not similarity of customs shows a similarity of origin seems to be an open question. If any customs do, it is to my mind their religious rites, for experience and observation prove that they are less likely to change these than any other. In customs there is little difference among these tribes, the more northern Indians being a little more savage.

The Twana language has another form of numerals for counting money, stones, and small round things, which differs from the form given mainly in adding to it lĭs, elĭs, alĭs, or ta lĭs as a final termination. The Skwaksin a second series, used mostly for counting money, which is made by adding els. The Klallam has also a second form, used in the same way as the Twana and formed by annexing ût-hu or aiût-hu; and also a third form for counting animals, which annexes to the original eks, ûks, or e·ĭks. In counting large numbers they cut notches on sticks to assist their memories. I am not aware that any of them knew anything about multiplication before the whites came, except by repeated additions.

Time.—The year was divided into thirteen moons, for each of which they had names, but I have not been able to learn that they had any names for particular days. The day-time was divided into dawn, sunrise, forenoon, noon, afternoon, sunset, and dusk, and the night had only the division of midnight. The present names of the days of the week have been adopted since the whites came among the Twanas. They signify holy day, one day past, two days past, etc.

Length.—They had four standards of measurement of length: (1) from end to end of the middle finger outstretched; (2) from the shoulder to the end of the corresponding hand, arm extended; (3) from the shoulder to the end of the opposite hand, arm extended, and (4) the fathom. In travelling the standard was the distance which a person could travel in one day.

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*Vol. 1 Contributions to American Ethnology, pp. 159–177.

†See Swan's Indians of Cape Flattery, p. 57.

I do not know that land was measured, but in all square measure the above linear measures were used.

Quantity.—In measuring articles in bulk their baskets were used, but I know of no basket of standard size being used. A person making a bargain for a certain number of basketfuls would have to see the basket.

Currency.—The dentalia shell and the abelone shell, or parts of it, were the nearest thing to money which they had, the former being the most valuable. A species of olivella shell, found in Klallam waters, was sometimes brought to the Twanas, by whom it was used partly for money. Slaves, skins, and blankets were also used for a similar purpose, or rather for barter, but I have been unable to learn what value they put upon them or on the shells, as their values have changed greatly since the whites came. The value of the dentalia shell depended on the size as well as number, a long one being much more valuable than a short one.

WRITING.

They had no system of writing previous to the coming of the whites. Since that time a small vocabulary of the Klallam language, by G. Gibbs, has been published as No. 11 of Shea's Library of American Linguistics; another, of the Nisqually language, by the same author, may be found in Major Powell's Contributions to North American Ethnology, vol. I. A number of vocabularies of the Chinook jargon have been published, a list of which is given in Gibbs's Dictionary of Chinook Jargon, published by the Smithsonian Institution.* A small Chinook hymn book has been published in connection with the mission of the American Missionary Association at this reservation, and about two hundred words of the Twana language are published in Eells on the Twana Indians, p. 93. Otherwise I know of no writings or publications in any of the languages used among these tribes.

GAMES AND PASTIMES.

Gambling.—This is very common, there being but few who do not engage in it. There are also professional gamblers, who, like the whites, generally visit large gatherings, especially potlatches, to ply their trade. Among the women it is not so common.

There are three native modes:

(1) With one or two bones. This is played mostly by young men and boys, but sometimes a large game is played by experienced gamblers. The players sit in two rows about 6 feet apart and facing each

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*Smithsonian Miscellaneous Collections, vol. VII.

other with a long pole in front of each. There are from one to six played on each side, but rarely more. Then one person takes one or both of these bones and rapildly changes them from one hand to the other. One person on the opposite side guesses in which hand it is, or if both bones are used he guesses in which hand a certain marked one is. If he guesses aright he wins, and he or some one on his side plays next; but if not, he loses, and the other side continues to play. While one man is playing the rest of his party beat with a small stick upon the pole in front of them, and keep up a continuous sing-song noise in regular time. The sums bet on this game are generally small, say from 50 cents to $1.50, but sometimes the stakes are much larger.

Some grow so expert at this game that even if the guess of the opponent is right the player can afterward change the bone to the other hand without its being detected.

The tally is usually kept by two of the players, one for each side, with sticks 8 or 10 inches long, sharpened at one end and stuck in the ground. These sticks are moved according to the success of either party. A modified form of this game is played by using two larger bones or pieces of wood. One of these is marked in some way, either with a string tied around the middle of it, a carved circle, or if it be of wood the bark may be removed except in the middle, where a zone is left. When the small bones are used, it is optional whether one or two be employed, but when they play with the larger ones it is necessary that both be used, for if the player has but one it would plainly be seen in which hand it was.

(2) With round disks. This is the men's game, as a general thing, but sometimes all engage in it. There are ten of these disks in a set. All but one have a white or black and white rim. Five of them are kept under one hand of the player on a mat, and five underneath the other hand, covered with cedar bark, beaten fine. After being shuffled round and round for a short time, one of the opposite party guesses under which hand the disk with the black rim is. He tells this without a word, but with a peculiar motion of one hand. If he guesses right, he wins and plays next; but if his conjecture is incorrect, he loses, and the other side continues to play. The two rows of players are 10 or 12 feet apart. Generally they have six or more sets of these blocks, so that if, as they suppose, luck does not attend one set they can try another. These different sets are marked on the edges to distinguish them from other sets. Another way of distinguishing them is by having them of slightly different sizes. They are made very smooth of hard wood, sand-papered, and then by use are worn still smoother. In this game they keep tally with a number of sticks, used as checks, about 3 inches long. The number of these varies according to the amount bet, twelve of them being used, it is said, when $20 is wagered. I have never seen more than forty used. They begin with an equal number of checks for each party, and then each side tries to win all,

one being transferred to the winner each time the game is won. If there is a large number used, and fortune favors each party nearly alike, it takes a long time, sometimes three or four days, to finish a game. This game is sometimes played by only two persons, but usually there are many engaged in it. In the latter case, when one player becomes tired, or thinks he is in bad luck, another takes his place.

Another form of this game is called the tamanous game. A large number of people, who have a tamanous, including the women, take part in it, but the men only shuffle the disks. The difference between this form of the disk game and the other form consists in the tamanous. While one man plays the other members of his party beat a drum, clap their hands, and sing, each one, I believe, singing his or her own tamanous song to invoke the aid of his special guardian spirit. I was lately present at one of these games where forty tally blocks or checks were used, and which lasted for four days, when all agreed to stop, neither party having won the game. Very seldom do they play for mere fun. There is generally a small stake, and sometimes from $100 to $200 is bet.

The Indians say that they now stake less money and spend less time in gaming than formerly. It is said that in former years as much as a thousand dollars was sometimes staked and that the players became so infatuated as to bet everything they had, even to the clothes on their backs. At present they seldom gamble except on rainy days, or when they have little else to do.

There is no drinking in connection with it. Outside parties sometimes bet on the game as white people do.

There is a tradition that when Dokibatt "came a long time ago he told them to give up all their bad habits and things, these among others; that he took the disks and threw them into the water, but that they came back. He then threw them into the fire, but they came out. He threw them away as far as he could, but they returned, and so he threw them away five times, and every time they came back, after which he told the people that they might use them for fun or sport."

(3) The woman's game. This is played with implements made of beaver or muskrat teeth. It is played much after the manner of dice. There are two pairs of them. Generally two persons play, one on each side, but sometimes there are two or three on each side. The teeth are taken quickly in one hand and thrown down on a blanket. One has a tring around the middle. If this one is down and all the rest up, or up and all the rest down, it counts four; if all are up or down it counts two. If one pair is up and the other down it counts one, but if one pair is up or down and the other divided (unless it be as above when it counts four), then it counts nothing. Thirty is a game, but they generally play three games and bet more or less money, dresses, or other things. They sometimes learn very expertly to throw the one with the string on it differently from the others by arranging them in the hand so that

they can hold this one, which they know by feeling a trifle longer than the others. They often keep tally with small sticks 3 or 4 inches long and about the size of a lead-pencil. But if they can they use the bones of birds' legs of about equal size. Each one keeps tally for herself. It is seldom that I have seen this game played, as the women have so much to do they have less time at their disposal than the men. They can make mats and baskets on rainy days.

(4) In addition to this a considerable number of the men have learned to play cards on which they bet considerable amounts. This, as yet, is the only mode of civilized (?) gambling which they have learned.

FIELD SPORTS AND FESTIVE GAMES.

Dancing.—This is usually a religious performance. It is, however, sometimes practiced for mere sport, and I have seen them thus dance until exhausted by their laughing and efforts.

Horse-racing.—As far as I know the Klallams have none of this, but a few times during each year the Twanas engage in it. It is usually conducted after the manner of the whites as far as they can do so.

Shooting.—A field sport which is now entirely out of date was the shooting of arrows, the object being to see who could shoot the farthest, and large bets were made. The winning arrow would sell for a large price.

Children's plays.—Indian children, like white children, have their own special plays, and also imitate the ways of their superiors. Among the former are ball, shuttle cock, shinny, and a native game in which there are two parties. One side holds some article, while a person from the other side advances to get it. The members of first side say all the funny things they can, and the opposite can not have the article unless their representative can get it without laughing.

In games of imitation they go through all the motions of gambling and tamanous, and these seem to be the principal ways in which they mock the older Indians.

In imitating whites they sometimes have several post-offices a short distance from each other, with as many postmasters, and a mail carrier who carries bits of paper from one to the other, or they will hold a council in remembrance of the time when some distinguished person from Washington has been here, when they will make speeches, have an interpreter, and all things in regular order. Again it will occasionally be a church, while they go through with the services, or a court with judge, jury, lawyers, witnesses, and a criminal. An odd occurrence took place at one of these mock courts some time ago which happened to be overheard by their teacher. A boy was on trial for drunkenness. When the proper time came the criminal arose and said substantially as follows: "Gentlemen, I am a poor man and not able to employ a lawyer, so I must plead my own case. The court has been slightly mistaken about the case. I am a white man; my name is Captain Chase (a white man living near the reservation). I came to church on Sunday. The minister did not know me; as I was well dressed he thought I was a good man, and might have something to say, hence he asked me to speak. I knew I was not a suitable man to address the congregation, but I could not well refuse. So I rose and went to the platform, but I had some tobacco in my mouth. I tried quietly to take it out and throw it down without being seen, but the Indians noticed it, and thought a minister should not chew tobacco, and beside I did stagger a little. These are the reasons I am on trial here."

MUSIC.

Music among these Indians consists more of noise than melody. As a rule the Klallams are far more musical than the Twanas. The women sometimes sing alone when at work, at funerals, and when tending the children; but in nearly all their gambling, war, boat, and religious songs the men take the lead. All persons sing the same melody, but sometimes the pitch varies considerably with different persons.

Their instruments are also intended more for rhythm than anything else. Indeed, no single one can vary the tone, the only modifications being loud and soft. They are used chiefly in their religious performances. They consist of the drum, deer-hoof rattles, scallop-shell rattles, and hollow rattles made from wood. Those who have no instruments pound with small sticks on larger ones, and clap their hands.

Songs.—These consist of work, patriotic, and boat songs, and songs for gambling and the nursery, for love and war, for funeral and religious ceremonies. I have known of instruments being used only with those for war and gambling, the boat songs, and religious songs, and in all of these the aid of their spirits or tamanous was invoked.

When gambling the singing is universal in the first method described, and is accompanied by the pounding on large sticks with smaller ones, different songs being sung by opposing parties. The words have no meaning. When gambling in the second method there is usually no singing unless it becomes a tamanous game, when a drum, one for each party, is brought in, and there is pounding on sticks and clapping of hands and singing. In this singing I understand that each one is invoking the aid of his or her tamanous, so as to win the game. I was present at such game not long since, and when in the house the singing was a confused medley on different keys and I could catch nothing of it, but when I was a few hundred yards away the sounds had mainly blended into song.

Drums.—These with the Twanas have a square rectangular head, the sides of which vary in length from 1 to 2 feet or a little more. They are made of deer-skin stretched over a wooden frame. Each one has only one head, and on the reverse side two leather thongs or straps are crossed at right angles, so as to form a handle. The drum is held with one hand and the drum stick in the other. They are only from 3 to 6 inches deep, but vary in tone according to size. The Klallams use the same kind of drums, and also have another, which is similar in all respects except that the head is round instead of rectangular.

Rattles.—One variety of rattle is made of deer-hoofs, sometimes in large bunches. These bunches are held in the hand or fastened to the waist while dancing. The Klallams sometimes also use rattles made of the scallop-shells which are found in their waters. A hole is made near the hinge of each shell, and a number of them are strung on a stick about the size of a lead-pencil, which is bent in a circular form and serves for a handle. These are shaken edge downwards. If shaken side downwards they are likely to be broken, in which case the person holding them will, according to their belief, die soon.

It has been found impracticable to translate American hymns into Chinook or to compose hymns in this language which will rhyme. The chief peculiarity which I have noticed in making hymns in this language is that a large proportion of the words are of two syllables, and a large majority of these have the accent on the second syllable, which renders it almost impossible to compose any hymns in long, common, or short meters.

ART.

There is no special class of artists among them as there is among the tribes to the north in British Columbia, still they make considerable work that is quite artistic on baskets, cloth, leather, wood, etc.

Their work as a general thing does not equal that of more northern tribes, but is fully equal to that of the tribes east and south. All the figures on baskets are woven in with colored grass.

LANGUAGE AND LITERATURE.

Six languages are in use by these Indians to a greater or less degree. The Twana is spoken by those who originally constituted the tribe. The Skwaksin dialect of the Nisqually language is employed by a number who have become incorporated into the Twana tribe and who now constitute about one sixth of it. It is understood also by nearly all of the original Twanas, and is used besides by a large number of the tribes on the Sound as a means of intercommunication.

The Chemakum is used partly by a few members of that tribe. The Klallam is used by all the members of the Klallam tribe, and dialects of the language extend into British Columbia.

The Chinook jargon has been ably compiled by Hon. G. Gibbs. I know of but three words in this locality of Indian origin which are not in that dictionary. (1) Să-by, *a long time*, found in Swan's vocabulary; (2) Stó-blo, *the north wind*, from the Nisqually stob-la; (3) Whilom, *a thread* or *rope*, which is of Klallam origin. Out of about 800 words and phrases which answer for words given by him, only about 470 are used here, which shows how the same language will vary in different localities.

MYTHS.

Thunder and lightning.—The general belief has been that these are caused by a great bird flapping its wings, and some point to trees that have been struck by lightning and say that the bird touched these trees and hence they were torn to pieces. Some say they have seen the bird, but others do not believe this. A fable by the Indians says that the Doswailopsh mountain had two wives: Mount Ranier was one, and a mountain near Hood's Canal was the other; Mount Ranier and this mountain quarrelled and Mount Ranier moved away, and now they always fight by thunder and lightning.

The sun.—In addition to those traditions given in "Eells on the Twanas," I give the following from the Klallams:

"A long time ago there was only one woman in the world, but no man. She made a man of gum and set him up and wished him to become alive and to be her husband. She went to sleep and life came to him. Being of gum, he was very sensitive to the heat of the sun, which was much hotter then than now. He worked when it was cool and rested in the shade when it was hot. He had some children. One day he went fishing and told his wife to look out for him if it became hot; but she went to sleep and did not do so, and the heat grew intense and melted him, and he died. His sons were very angry at the sun for this; one of them made a bow and very many arrows. He shot them up towards the sun and they formed a chain or rope on which the boys ascended, and found a prairie land. They asked the geese, who could then talk, 'Where is the man who killed my father?' and the geese pointed in one direction and said 'Yonder.' The boys went in the direction indicated, and came to a house where two blind women lived, and they sat down. As one woman gave some food to her companion one of the boys took it. 'Have you received your food?' said the first woman to the other. The latter replied 'No,' and both wondered what had become of it. Soon one of the boys said he had taken it and asked 'Where is the man who killed my father?' The woman replied, 'Farther on,' and gave them a very small basket, in which were six salmon berries. The boys went on and soon found some swallows which could talk, and again they asked, 'Where is the man who killed my father?' The swallows said 'In yonder house.' The pair went to the house and found an old man piling pitch wood on a very hot fire, so hot it nearly roasted the boys, and this was what made it hot on the earth. They gave the old man the six salmon berries, which became very many and swelled within him and killed him. The fire then went down somewhat, and it has not been so hot on the earth since."

FABLES OF THE TWANAS.

The pheasant and the raven.—The raven had a trap and caught very many fishes, but would not give any to the pheasant. At last the pheasant went to hunt deer. While he was on his way a deer met him, driven by a man. The pheasant killed it, and when he was skinning it the man stood watching him and said, "Well, pheasant, you can shoot straight;" but the pheasant thought it was not so. So when the man saw that the pheasant was not proud, he said that the latter would be able to carry the deer nearly home, only when he should almost reach his house that it would become very heavy. And so it was; for when he was almost home it became so heavy that he could not carry it. He laid it down, and his wife came and helped him. When the raven heard that the pheasant had killed a deer he sent his sons to carry some fishes to the pheasant, so that he might receive some meat in return; but when they were going into the pheasant's house the pheasant drove them out. Then the raven told his children to fight with the children of the pheasant, and they had a battle. The raven's children threw fishes at the pheasant's children, who, in return, threw the grease of the deer at the raven's children. The raven sat between the two armies, and when the little pheasants threw any grease the raven caught it and ate it. After a time the raven went to hunt deer. While he was travelling he met and shot a deer, driven by the same man whom the pheasant had met. While he was skinning it the man, acting as if he was surprised, said, "The raven can shoot straight." The raven was proud, and said, "I can shoot straight, because I am a raven." When he was about to carry the deer home the man said that when he should nearly reach his house it would turn into something else. So, when the raven had almost got home, he dropped his game and went and told his wife where to find it. She went to the place where he had left the deer, but when she arrived she found it had all turned to rotten wood.

A woman and her husband.—At one time there was a woman living at her father's house, and after awhile a man came by night and took her for his wife, but soon afterwards he deserted her. After a time she took some of her father's slaves and went to the other side of the water to hunt for the man, but was unable to find him. So she started for home, but after having gone some distance she looked down on the bottom of the canoe and saw a man smiling at her. She knew it was her husband; he pulled her down, and the slaves saw her no more. Some time afterward she made a visit to her parents. At a second visit a child was born to her. On a third visit her face was covered with some kind of moss. During her second visit her parents wished to deceive the man, hence they took a slave with a face exactly like that of the married woman and started to carry her to the man, but a sea-gull cried out and said it was not the right woman, so they took the true wife and restored her to her husband. This man killed a great many fishes and sent them to his father-in-law. After a time the woman died and there was afterwards heard a voice crying, which was the woman's voice. When this woman's tribe go off to sea they always capsize. (Some Indians believe this to be true.)

A Colcine Indian and a wolf.—One day a woman espied a wolf swimming across Colcine Bay. She told her husband, who, wishing to have the skin, went to kill the wolf, but his wife begged him not to do so. The man rowed out to the wolf and patted him on the head with his paddle. The wolf looked at him and threw his ears back as if he would beg for his life. At last they both reached the shore, when the wolf did not run away from the man, but stood on the shore and looked at him with his ears back. The man, then wishing to deceive the wolf said, "I do not want to kill you but was afraid you might drown, so I came to help you across. Now, for a reward, I ask this: You must drive as many deer to me as you can." So the wolf went into the woods and drove home deer until the man's house was filled with meat. Every time the wolf came home he would drive home a deer.

The taming of two young wolves.—There was once a great hunter (who the narrator said was his father's brother), at one time when out hunting who found two young wolves which he thought he might tame, so that they would assist him in hunting deer. He brought them home, and when they were partly grown he took them out. While they were going along they found the mother wolf, and as the man wished the cubs to grow fast he took her too. After that this hunter never failed to kill deer. "This," said the narrator, "only shows how animals can understand and act well to those who are kind to them."

Although there is something fabulous in the former of these last two stories, if not in both, they may show how the Indian dogs were first obtained by domesticating wolves.

DOMESTIC LIFE.

Marriage.—Among these Indians marriage by purchase was formerly the universal custom, and even now they are loath to abandon it. It is customary for a man to seek for a wife within a certain circle of his relatives. I knew a widower of perhaps forty-five or fifty years who sought to marry a woman properly related, but being refused he was at liberty to seek for one wherever he wished. He found a girl not over fifteen years of age among the Skwaksins, not as old as one of his daughters, and married her. Her father consented to the marriage and she, although reluctant, was obliged to submit. It is not often that a marriage takes place where either party strongly objects, but oftentimes the relations consult the parties to some extent, doing at the same time most of the courting for them.

Usually a man's relatives help him to pay for his wife from $100 to $400 worth of money, blankets, guns, horses, and such articles, which are given with many speeches and much ceremony, something being said as each article is presented, the whole occupying one or two days. Occasionally the parties live together for some time, even a year, before this formal ceremony takes place.

Marriages with other tribes are common. The Twanas are intermarried with the Chehalis, Skwaksin, Nisqually, Puyallup, Snohomish, Port Madison, Lummi, Chemakum, and Klallam Indians, and the Klallams with the Twana, Snokomish, Chemakum, Makah, Kwilleut, Nittinat, Cowichan, Sook, Victoria, and Summi Indians. It is very common when an Indian begins to speak of his ancestry to find that there is the blood of some other tribe in his veins, through either the parents or grandparents. The children belong to the tribe of the father usually, and the mother is adopted into the same tribe, though there are occasional exceptions to this rule. At one time I saw a Klallam man who had just married a Nittinat woman, and when they were married the man could talk the Klallam and Chinook languages but not the Nittinat, and the woman could not speak either Chinook or Klallam. The Twanas, Klallams, and Chemakums are also intermarried with the whites. Very few of either tribe have more than one wife each, the custom of the whites and the law of the agent preventing new cases of polygamy, although those who formerly had more than one wife have not been compelled to give them up.

Children and their cradles.—A few have adopted cradles on rockers, similar to the poorer ones of the whites, but the old way of bedding infants is by far the most common. For this they take a board a little longer and a little wider than the child, or hollow out a thick cedar board, about the same size, to the depth of an inch. In either case they place on this board beaten cedar bark, on which they lay the child, who is then covered with cloth and tied to the board by strings which pass through the holes in it. The hollowed form is more common with the Klallams, and the other with the Twanas. A cap of cedar bark, usually of Makah make, is sometimes used by the Klallams as a cover to protect the babies from the smoke.

The practice of flattening the head, which was formerly common, is now ceasing. It has so often been described that I can say nothing new about it. Some who have had the head flattened in infancy seem to make as good scholars as those who have not been thus treated. One Indian attributes much headache to this cause.

Naming children.—Usually they are not named at as early an age as with the whites, but when one, two, or three years old. Formerly, when the name was given, a feast was made and presents given to the guests. An Indian may change his name once or several times during his life; sometimes he does so when one of the same name dies, as it is not good etiquette to pronounce the name of the recently dead. Two or three years after death the name of the deceased may be mentioned; and with the Klallams, at least, a person may take the name of his departed father, grandfather, or other direct paternal ancestor. Often when this is done, the person thus changing the name makes a feast and gives presents. Nearly all the men, women, and children have "Boston" names which they have received in various ways. Some of these are a combination of Indian and American names and constructed utterly regardless of taste.

SOCIAL LIFE AND CUSTOMS.

Eating.—Generally they eat three times a day. At a visit of seventy-five Twanas to the Klallams of Port Gamble, they feasted three times during one night, closing at 2 or 3 o'clock in the morning. The feasting was interspersed with gambling, conversation, and the giving of presents. In December, 1878, the Dungeness Indians and some Indians from Port Discovery were invited to a feast at Sequin, which lasted two nights. They feasted first at one house, where they tamanoused in a manner similar to that described as occurring at the same place two years previous, and made presents; after this they went to another house and did the same, then they repeated the same performances at a third house, and closed about 2 in the morning. On the next night they went through the same acts and ceremonies; fourteen boxes of biscuit and a barrel of sugar were consumed or carried away by about one hundred and twenty-five persons, men, women, and children; quite an amount was carried away by them, this being customary. Very often their feasts occur in the day-time, and consist of only one meal if the guests are few. There is more or less feasting at all their large gatherings, including those for religious purposes.

Potlatches.—A peculiar custom with the Indians in this region is the potlatch, which takes its name from the Chinook word, meaning to give, as the most prominent feature in it is the distribution of gifts. I have never heard of this custom existing farther south than the Columbia River or farther east than the Cascade Mountains, but on the west it extends to the Pacific Ocean, and on the north into Alaska, a rich chief there having in 1877 made one at which four thousand Indians are said to have been present. It seems to be chiefly confined to those Indians who live near the salt water, as it would be difficult for those who have to travel on horseback to carry the amount of articles which they have need of on such occasions. How old the custom is no one seems to know. A part of the ruins of a very old potlatch house were found while digging below Port Gamble. The origin of the custom is supposed to be as follows: A chief wishing to gain the favor of his people gathered them together and made presents to them; after a time this was repeated and people of other tribes were invited on account of friendship, and the compliment was returned; chiefs or other persons who wished to become prominent followed the example until the custom grew to its present proportions. Now nearly all the surrounding tribes are invited and almost every individual, both man and woman, feels bound once, at least, to have a share in giving a potlatch; the potlatches now become so expensive that seldom does a single person feel able to make one, hence many combine their resources for this purpose.

Often a person will save everything possible for years in order to give it away on such occasions, and when one feast is done they will begin to save for another. In the distribution all do not receive equal amounts, but special friends, the young and strong and those who are planning to make a potlatch, generally receive the most in the hope that they may return the compliment at some future time, but the old and those not likely to give such an entertainment receive but little, it being a poor investment to give to such persons. Potlatches are the greatest festivals of these Indians.

Tamanous ceremony and social intercourse, including feasting and the distribution of presents, are the prominent features of the occasion, while as side shows they have courting and gambling, the latter being very prominent.

These feasts do not occur with any regularity, and there are many old persons who have not taken part in giving more than one potlatch in their lives. About the year 1868 one was given by a number of Twanas. In 1876 another was given to a totally different set of the same tribe, and in 1878 another was given by them in which only one man participated who was present at one ten years previously. Others of those engaged in 1868 had intended to take part, but some of their children having died they gave way so much at their funerals that they had nothing left to share in the potlatch.

I was present at a potlatch given by several Twanas on the Skokomish reservation in October, 1876. For many years they had been preparing for it. Old women went in rags, while filling trunks with calico to give away at this time. Of these boxes of dry goods some had been deposited in my hands for more than a year. In the winter of 1874–'75 they began the erection of the house, working only a day or two at it now and then; but in the summer following the leader of the affair died and nothing more was done until the spring of 1876, when others took hold of it and half finished it. They set the time for the potlatch in August, but because they were not ready deferred it for one month and then for another. Two or three weeks previous to the event they again went to work at the house and finished it. It was by no means large enough for all who were present, but mat houses, tents, and other temporary shelters were put up around it by various persons. About the 14th of October they sent runners to the various surrounding tribes and on the 29th the first installment arrived, consisting of about a hundred Chehalis Indians. They came in wagons and on horseback to within about 4 miles of the house—as near as they could because of water. Here they were met by a leader of the potlatch, and after considerable speech-making they camped for the night. The next day the Twanas sent six large canoes to take them to the house. At noon they rowed past the agency, 1 mile from camp, abreast, singing a solo and chorus, accompanied by drumming on two drums and pounding on canoes. After passing the agency they broke line and so went on for a mile or more until they came in sight of the potlatch house, when they again formed abreast and rowed to the house in alignment with their music. At landing there was more ceremony, for the visitors had brought many presents. Each present was held by the donor while he made a speech, after which he gave it to a Twana, who replied to the speech, when the gift was handed to the one for whom it was intended.

These presents consisted of calico, blankets, two beeves, dried meat, and money ($60 having been counted as coming from one canoe), and seemed to be given to the prominent Twanas. The Chehalis then landed and went to one part. of the house assigned them, where they took lodgings. The whole performance occupied three hours and was longer than that of any other tribe. Two days afterwards the Klallams came in sight and when about 3 miles away a member of the Twanas went into a canoe to meet them and learn their wishes about landing, this being the common custom.

They learned however that while the Klallams were coming, a child had been killed by the caving of a bank. The child had some relations among the Twanas, who immediately began a mourning. The Klallams stopped on the beach at a Twana burying-ground, a mile from the potlatch house, where they left the corpse in a box on a log, covered with mats and blankets, as they intended to take it home with them on their return Here a canoe-load of the Twana relations of the child came, and there was mourning again, but it did not last very long, and after it was done the Klallams entered their canoes, went a half mile farther and camped, most of the afternoon having been thus consumed. The next morning they all came abreast close to the shore near the house in about fifteen canoes, singing and dancing and pounding on drums, canoes, and boards. It was intended that this should be the grand reception, as the Klallams are about the best musicians and performers on the Sound, but a strong wind arose so that it was hardly possible for the canoes to remain long near the water's edge. While they were in front of the house they sung solos and choruses, some of them holding guns and paddles in their hands and jumping up and down. One had a rattle. Some had on cedar-bark bands, which had eagles' and hawks' feathers and wings in them. The faces of the majority were painted—many black, a few red. After a few minutes of this performance the Twanas replied to them from the beach in a somewhat similar way. Some of the faces of the Twanas were blackened a little, but not as much as those of the Klallams, and they had neither rattles, headbands, guns, or paddles.

Thus, the salutation and reply were kept up for about half an hour, when the Klallams landed with no further ceremony and went to their quarters in the house.

The ceremonies of landing were a slight part of the black tamanous and the only performance of the kind during the potlatch, and this was the only reception in which the Twanas replied to the songs of their guests.

Other tribes kept coming every day or two for two weeks, and the reception was much like that already described. Generally, they were met 2 or 3 miles before reaching their destination by some of the Twanas, who learned their wishes about landing and directed preparations to be made accordingly, and commonly they brought some presents of cloth, food, and money and danced and sung, but a few landed without any ceremony. When they had all arrived it was estimated that there were from a thousand to twelve hundred present, comprising, besides those already mentioned, Skwaksins, Nisqually, and Port Madison Indians and a few from the Snohomish, Lummi, and Puyallup reservations.

They who lived farthest off had come a distance of about 150 or 175 miles, but these had relations by marriage among the givers of the potlatch. Generally the evenings were occupied with dancing of some kind, either serious or comic. Frequently one whole evening was allotted to the dancing of one tribe. These dances were accompanied with drumming, singing, and clapping of hands. In dancing they jumped up and down, sometimes joining hands in a circle, and sometimes each one dancing singly, jumping the whole length of the house. At times the men alone danced, and again the women joined them, generally having a part of the circle to themselves. Once almost all joined in the dance, having green branches in their hands. On this occasion they danced at one time without progression, and at another time they moved around from one end of the house to the other. The Klallams gave one dance, difficult to describe, in which men only participated. In this a leader, painted, with eagle wings and feathers dangling from his head, and arrayed in a long blanket, played very curious antics with contortions of his neck, hands, and entire body, while the rest stood near him, jumping up and down to their music, and afterwards all dressed in striped shawls and blankets, danced the whole length of the floor with many absurd maneuvers. I think this was a war dance. One dance was said to be in memory of a deceased child, after which presents were made by friends of the child to some of the Twanas. Thus almost every evening was occupied from the time of the arrival of the first until the close of the affair, a period of three weeks.

There was more or less gambling during the day-time and occasionally at night, but few, comparatively, being engaged in it at any one time. Sometimes the gambling was accompanied by music. Once it was said there was a bet on a game of $200 in money, together with several horses and guns, but the parties played until 6 o'clock in the morning and then stopped, neither party winning.

Generally they gambled with disks, but sometimes with the pairs of bones or cards already described. There are said to be professional gamblers among them who visit such gatherings, without an invitation, in order to ply their avocation.

There was much of tamanous in connection with the dancing, and one evening was wholly occupied in a tamanous over a sick woman and child. There was some of this in the day-time also.

The Twanas, from their own resources or from the presents which they received, were expected to feed their guests most of the time. Sometimes they gave the food to the visitors, who cooked it for themselves, but once or twice a day commonly they both cooked and distributed the food. When this was done, they seated their guests in the middle of the house in two rows on mats. When the meal consisted of boiled rice, wheat, or fish it was placed before them in large kettles, from which they helped themselves with their native ladles; but when it consisted of berries and crackers, bread, apples, potatoes, and dry food it was placed in troughs, made of 6-inch boards, 8 or 10 feet long and three-sided. Sometimes, when the meal was over, two persons would stand, one at each end of a long row of eaters, holding tightly before their faces a piece of calico on which all would wipe their mouths. They then arose and departed.

The potlatch or distribution of gifts took place in the day-time, two days after all had arrived. The women first gave away their things, and afterwards the men did the same. The gifts of the women were chiefly new calico, with a few dresses and a little money. Each giver gathered those to whom she wished to make presents in two rows facing each other, in the middle of the house; next she placed her trunks at one end of the rows, took out the pieces, laid them in a pile or two, counting them over, then, taking one or two things at a time, she carried one to each woman. Each piece contained, commonly, between 5 and 9 yards. Occasionally two or three women combined together and gave at the same time, if they were not very wealthy, but the richer ones gave each by herself. About thirty women thus distributed their gifts. Often several gave to the same person; though every woman present did not receive gifts, only those who were preferred. Three of the more prominent women gave away about one hundred pieces each, and I am not aware that any woman gave to more than this number of persons. If all averaged half as much, they gave away nearly 10,000 yards, and this was the best estimate I was able to make of it. This occupied about two days and a half. A day and a half was then consumed by the men, who gave money chiefly, but occasionally blankets and a few guns. The recipients were arranged much as with the women, but were all men, and the distribution was conducted in much the same style. There were ten male donors, each of whom gave, generally, from $1 to $2 to each of his friends, so that most of the latter received from $2 to $10 each; some got more, and one who was expected to make a large potlatch in a year or two received $40. They gave on an average a little over $300 each, and the whole sums given away amounted to about $3,300. A few of the donors borrowed some of this money from their friends with considerable ceremony, promising to repay. One Indian who received a nice beaded cloak and some other articles put them on a fire, where they were consumed, in memory, it was stated, of a deceased child.

The distribution of gifts was the last scene, for then the visitors put their things in their canoes and left with very little ceremony as quickly as possible, and in three weeks from the first arrival the house was deserted by the visitors. It is considered by them a breach of etiquette to remain in the house any longer than absolutely necessary after the gifts are distributed. A few of the Twanas remained in the house, using it as a dwelling, for a month or two, after which it was deserted for nearly two years, and some things about it suffered to go to ruin. This whole affair occurred 3 miles from my residence. I was not able to be there all the time, but was present a few evenings and a part of nearly every day and gathered what information I could from others who were there in my absence.

Another potlatch took place at Jamestown, in Clallam County, and was given from February 2 to February 10, 1878, by a part of the Indians of that place. The house was built for a large dwelling a year or two before, the potlatch, however, being in contemplation, and was about 32 by 84 feet. It was by no means large enough to hold all of the Indians who attended, but in the village there were about a dozen dwellings, in which some of the visitors were received. The beds and seats of this potlatch house were much the same as that of the Twanas, but the shelves overhead for the storing of articles were differently arranged. Instead of being all around the house over the beds, they were along the side walls, with one shelf across the middle of the house. The two at the ends were used chiefly for storing articles belonging to the visitors, and the central one was for storing food, which included sixty sea-biscuit and a few half barrels of sugar, brought by the guests and presented to their hosts. In one corner a blanket was fastened up, evidently to make a screen for a dressing-room. I was present nearly all of the time, having been requested by the Twana and Klallam chiefs and the Indian agent to go, in order to oversee the festivities and prevent any conduct that might tend to produce a disturbance.

The invitation was received at Skokomish on the 26th of January, and on the 30th we started, and arrived at Dungeness on the evening of February 2. The morrow being Sunday, I induced them to land at once, instead of postponing it until next day as is usually their custom when reaching a potlatch place in the evening. My companions preferred that I should not be with them during the reception and hence I went ashore in a Klallam canoe which came to meet us.

About ten canoes from Sook, in British Columbia, had arrived that morning, with perhaps one hundred and twenty-five Indians; twenty-five persons from Port Discovery, the same number from Port Townsend, and forty from Sequim had arrived during the day; sixty from Port Gamble had also arrived within a day or two.

That evening was given to the Twanas, who sang and danced the black tamanous. In the dance each remained in one place, and, to keep time to the music, jumped up and down a little or bent the knees. Their faces were also blacked in various ways. In fact, from this time for five days the faces of most of the Indians present, men, women, and children, were blacked more or less, some during the whole time. The paint was laid on in diverse patterns of stripes and spots, and some were wholly in black, others in red or black. The next day being Sunday, most of them attended divine service; but they were too much excited to give up the whole day to rest, so in the afternoon a number of the women assembled in one of the large dwelling-houses in the village, sat down on mats in two long rows, facing each other, and pounded with small sticks (1½ or 2 feet long) on larger sticks and boards in front of them, and sang for some time. There was a second performance in another house afterwards by the women, in which they sang much as before, only they were accompanied with the drum, and were seated in a large circle. Within this circle two women and four girls danced. These six dancers, being graduated in size, arranged themselves accordingly, from the tallest to a child about eight years old. Their shawls were pinned behind their backs so as to cover their hands, which were extended about a foot and a half from their bodies, and they danced around a circle 8 or 10 feet in diameter. The evening was given to the Sook Indians in the potlatch house. For a time they danced in one end of the house in a manner similar to that of the Twanas the previous evening, but with more jumping, and their singing was more varied and quite wavy. After a time two of them stripped to the waist, and, with their drawers rolled above their knees, ran forward the whole length of the house, striking at everything and everybody within their reach, their arms constantly swinging around them; sometimes they went down on all fours, and, having snuffed the ground, rose again. Around the waist of each was tied a rope which extended back 6 or 8 feet, and was held by another Indian, who frequently jerked it, sometimes throwing the tied man to the ground.

Another dancer had a hideous mask on his face and a blanket on his shoulders, but his actions were not so fierce as those of the other two. He often sat down. When these were done, other Sook men came, shaking rattles, beating drums, singing, and going back and forth in the house and scattering the people who were standing around. This performance was kept up until late at night.

Monday forenoon was spent at a feast, to which men only were bidden. Beef and potatoes were cooked thus: A large number of stones were placed in a fire out of doors, and when hot the food was placed on them, covered with small dry bushes and mats, and so kept until it was cooked. At this feast the Indians did not eat in the main potlatch house, but at the residence of one who helped to give the potlatch, and who was the sole giver of this particular feast. The Indians all ate around the house on the platform made for beds, and the long troughs for food were placed in front of them on the same platform. Most of these troughs or plates were similar to those used in the Twana potlatch already described, but some were dug out of wood, were 5 or 6 feet long, 2 or 3 inches deep, and about 10 inches wide. There was one which was dug out roughly, about 24 feet long and the same width as the others. Whatever food was not eaten was carried away, and after the feast was over crackers were given the guests on purpose to be carried off.

For napkins they used small bundles of beaten cedar bark about 2 feet long, which are very desirable, as in these feasts they eat with their hands. As soon as the meal was finished there was to be some kind of performance by the medicine men, and no other persons were allowed to remain. In the afternoon, as I returned from my dinner, I saw a masked Indian, the same I suppose that was masked the night before, and three others similar to the two half-naked men of the previous night, dancing backward and forward for a distance of about 100 yards on the beach in front of the houses. The masked dancer went through some performances not fit to be described. Their dance consisted chiefly in running around with ropes encircling them, held by others, as on the previous night. This dance continued until about 2 o'clock P. M., when they danced off into the woods, followed by forty or fifty of their friends, with the singing, etc. They all formed a large circle as they moved off, and did not return until 5 o'clock, when they reached the beach a quarter of a mile from where they left it. Some three of them, apparently tired out, were each jerked up by six men wrapped in blankets and carried into the potlatch house. One walked in supported by attendants. I have inquired frequently the meaning of this ceremony, and could get only the answer, "It is their tamanous." I infer it was an initiatory custom with the black tamanous. Some of them, I heard, were starved a part or all of the time. One young Klallam half-breed, it was said, was told that he would be obliged to go through some such initiatory ordeal at this potlatch, and he delared he would rather run away and hide until it was over, but the Port Discovery Indians took him some time before the festival, guarded him closely, and compelled him to submit. I suppose this was true, as he was not seen anywhere until the ceremony was over. While these scenes were being enacted the women met and sang in their usual way, and when I asked why they did so I was told that they were tamanousing in order to get strong minds towards the men.

Towards evening the Indians of Elkwa, Pisht, and Klallam Bay arrived, and landed with considerable ceremony, dancing, drumming, rattling, singing, and making presents. The presents were generally a blanket or a few dollars to each one making the potlatch. One man gave the head potlatches eight or ten small sticks about 3 feet long, a promise, it was said, that he would, after reaching the house, give his host $150 in money. There were also a few more large presents given to the same man, which were kept, and returned to the givers at the close of the potlatch, so that the presenting was a mere form.

Many of them had the down of ducks on their heads and blankets. Before they reached the house a few Elkwa Indians, who had previously arrived, ran along the beach and entered the Elkwa canoes, so as to land with their own people. This was the last arrival. Some were invited from Victoria, but did not come. Those present were, as near as I could estimate: Twanas, from Shokomish, 90 miles distant, eight canoes, seventy-five persons; Sook Indians, from British Columbia, from 40 to 75 miles away, ten canoes, one hundred and twenty-five persons; Klallams, from Elkwa, Pisht, and Klallam Bay, 25 to 75 miles distant, five canoes, seventy-five persons; from Port Angeles, 20 miles distant, twenty persons; from Port Discovery, 7 miles, twenty-five persons; from Sequim, 6 miles, forty persons; from Port Townsend, 25 miles, twenty-five persons; from Port Gamble, 40 miles, five canoes, sixty persons; at Dungeness, one hundred. Total, five hundred and forty-five.

The evening was given to the Elkwas, and their performances were similar to those described. On Tuesday I was not present, but was informed that gambling and the giving away of calico were the principal features of the day.

On Wednesday forenoon the Indian who was to give the feast, Tenas Joe, made his potlatch in his own house, and in the afternoon there was a dance given by four girls, graduated in height. These were led by two old men. Some handkerchiefs and other articles were burned on a fire in memory of the wife of Tenas Joe, deceased. In the evening the Klallams danced their war dance, which was rather pretty and was said to be an imitation of the Makah dance. There were nearly twenty-five dancers, mostly men, who were dressed in American style, except that they had no shoes and wore parti-colored shawls and blankets thrown around them. One man carried an open umbrella. Their heads were bound with head-bands of cedar bark or kerchiefs, in which were long white or gray feathers generally tipped with red. Much feathery down was sprinkled over them. They had hollow wooden rattles and tails and wings of hawks or eagles in their hands. Their faces were blacked in various ways. With the music of the drum and singing they jumped around in a space 20 feet in diameter, throwing their arms wildly about, now up, now nearly to the ground, with movements quick as those of a cat in the midst of hot fire. That evening six of the principal potlatches gave me $7.50 to pay for my board while watching over them.

About 11 o'clock A. M. the finale of the black tamanous began. First, five men came out of the potlatch house to an open space in front of it. They were stripped to the waist, with no pantaloons on, but with drawers rolled up above their knees, and with shawls thrown over their shoulders. Each wore a head-dress consisting of a band, from which hung a large number of strips of cloth of various colors, but mostly red, about an inch wide and 12 or 15 inches long. So many of these strips hung in front that it was impossible to catch a glimpse of the face. Their legs were painted with stripes of red, and wet with water to imitate blood. They jumped around in many ways, high and low, sometimes running and clapping their hands, while the other Indians accompanied them with the usual chanting and black tamanous music. After a few moments they ran back into the house. Then about as many more came out in much the same garb as those seen on Sabbath evening and Monday afternoon, with ropes around their waists held by others. These had cut themselves slightly under their tongues and chins, so that the blood ran down their arms and breasts a little, and their faces were so black that it was impossible for me to recognize them, although well acquainted with some of them. They jumped around much as the previous set had done, and then went back to the house. Then the first set again came and performed in the same way as before, and ere they returned the second set were out again, but some of them were not held this time by the ropes. Such actions as these were kept up for nearly three quarters of an hour, when one set ran off up the beach for 200 or 300 yards, accompanied by their friends, both men and women, and soon the other set followed in a similar manner. I judged from appearances that I was not wanted, so did not go. They remained there about two hours, while I went to dinner, and the performers, it was said, were washed by the others. After this they came back. The first set were in front, surrounded by their friends, who kept up the usual noise. They ran towards the water as they advanced and then away from it a few rods, so that they moved along the beach very slowly. After them the second set came in a similar way and three women had by this time become so excited that they also danced as the men did, but in their usual dress. After them came a third company following one boy. He had on a shirt and pair of pantaloons, rolled up above his knees, and on his head a band with a very long feather standing up in it. He walked into the water knee deep, bowed his head until he dipped the tip of his feather in the water, then he walked slowly up the beach for about 2 rods, then went into the water again as before, and so advanced along the beach very slowly towards the house. This was said to represent a crane, and is called the crane tamanous. I understood that this boy, who was about fourteen years old and was a Klallam, was being initiated into this kind of tamanous. When each company came near the house each dancer was seized by two or three persons and hurried, half running and half carried, into the potlatch house. Two or three times I asked them what this was intended to teach and could only get the answer, "It is their tamanous." So I could only look on and gather most of my information in this way. As these are the rites of a secret society it is not strange that the members do not explain them to the uninitiated. After all went into the house two companies were formed, one at each end, and there was a strife to see which should conquer; but the house was so crowded it was impossible to see what had become of the dancers who were outside. A new dance was now performed. In this a number of men, taking hold of each other's hands, formed a circle about 12 feet in diameter and ran around a pole which was set in the ground. Outside of this circle was another running in an opposite direction, and outside the second was a third going in the same direction as the first.

There was no confusion and they kept good time to the usual noises. After this they formed sides to push against one another, each endeavoring to push the other from its position. There was not room inside for any one who did not wish to be pushed, so I stepped outside. The fun continued about two minutes and ended in a hearty laugh, which closed the scene for the afternoon. In the evening all dancing was carried on in one-half of the house. A large fire was built in the center of that half. At the end of the house I saw four of the heads adorned with head-dresses of cloth strips which I had seen during the day. I suppose they belonged to the first set of dancers. Their bodies lay prone underneath the bed platform. Each one, held down by a single man, kept his head constantly moving from side to side, and one groaned most of the time. They evidently struggled to rise, and during the evening one did get up, and it required two or three men to put him down again. Most of the company were seated around the side walls. Soon one man of the company arose, took a hollow wooden rattle, said a few words, and walked around the fire, frequently makingsome motion towards the men who were held down. Having gone around the fire once or twice, he shook the rattle towards some one, whereupon ten or fifteen men jumped up, ran around, threw their arms wildly about them, bent down almost to the ground, and went through various antics; at times two or three would catch hold of each other and jump up and down together; then one or two would seize the one with the rattle with feigned violence and exertion, feigned, I suppose, because only once during the evening did I see him brought to the ground, while he seemed to make little effort to stand up. This would occupy about five minutes, during which the music ceased not, when all would return to their seats, and the leaders would lay down the rattle. Then another would take the rattle, and the performance would be repeated, and this was kept up for an hour or more. After this was done, two of those nearly naked arose and danced the whole length of the house and back again, held with the ropes around their waists as before, and accompanied by others; then they were taken out with a great shout and, as I supposed, released. This done a company of half-dozen men took one of those who had been held down and slowly carried him outside where with a whoop he was let go; after him three others were taken out and released in a similar manner, the whole act being accompanied with the usual music. That ended the black tamanous scene as far as I know. By the next day nearly all the black paint was washed from their faces, and I saw but very little more of it during the potlatch. As far as I have learned the northern tribes on the Sound practice this black tamanous in a more savage manner than their brethren of the south, and I am told that in British Columbia it is marked by still greater severity. Friday forenoon was occupied by Dick Sooks and his father in potlatching money in the potlatch house, for the residence of the former was 5 miles away, and he was a relation of the head potlatcher. In the afternoon Port Discovery John gave sea-biscuit to the men, twenty-five to each. In the evening fifteen or twenty Klallam young men came dancing into the house where I was sitting. For a time they stood in a row and danced backward and forward the length of the house, but at last they stood at one end, dancing to the usual noises, except that of the hollow wooden rattle, for this instrument was laid aside when the black tamanous ceased. One Indian put on a shawl, took another sort of rattle made by the Clyoquot Indians, and danced in front of the rest shaking his rattle, jumping up and down and around and squatting. While this was in progress a small company of Twana young men were dancing in the doorway and on the outside, mostly out of my sight, but there was evidently some rivalry between the two companies. There was considerable merriment in these dances.

Saturday forenoon, Port Discovery John, son-in-law to the principal potlatcher, gave away his money and blankets. It was the first time I had witnessed all the ceremonies connected with the donation. He first arranged all the men around the house on the bed platform, and then, with five or six friends, spent some time in counting his money. Next, twelve or fifteen women came to serve as a choir, and sat down on mats near the money. Then came four girls, arranged according to size, as before described, with faces painted completely red, hair covered with down, hands extended, as on the previous Sunday, under shawls or blankets pinned behind them, who danced the whole length of the house and back a few times, the tallest going first, led by an old man—"Old Slaze"—and followed by one still older. The choir sang, accompanied with a drum. These ceremonies occupied about fifteen minutes, after which the potlatch began. The giver told a man who acted as crier the name of the person to whom the money or article was to be given; the crier then took the gift, heralded forth the amount of the same, with the name of the receiver, and carried it to the latter. Previous to this, however, certain amounts, varying from $20 to $50, tied up, were given to several persons, which I was told was to pay them for certain articles brought, or was money which they had brought and was now returned to them. These things occupied all the forenoon, and in the afternoon Old Slaze gave about twenty-five sea-crackers to each man. The next day being the Sabbath, I was with them but a very short time. The ceremonies, I was told, were about as those of the preceding day. This ended the affair, and after it, all left as soon as possible.

They left about noon, but the greater part of them went only 5 or 6 miles away, as they were reduced to sea-biscuit and sugar, which was very dry, and they wished to go where they could get clams and fish. The Twanas only remained with me until next morning, when we left.

The amounts given by the men, as near as I could learn, were as follows:

Wednesday: Money, $100; one beef, $30; one gun, $8; total, $138.

Thursday: Money, $170; one canoe, $20; twenty blankets, $40; total, $230.

Friday: Money, $270; one gun, $10; twenty-seven blankets, $54; total, $354.

Saturday: Money, $430; twenty-five blankets, $50; total, $480.

Sunday: Money, $420; twenty blankets, $40; total, $460. Total: Money, $1,390; blankets, $184; miscellaneous, $68; whole amount, $1,542.

One hundred dollars of Old Slaze's money belonged to his wife, but they combined together.

The men present received various sums, generally about $10 each, but some received as much as $30. Besides this, seventeen women gave to the other women calico at different times from Monday until Friday, each piece containing generally 5 yards, but varying from 4 to 9 yards. A rough estimate made the whole of this amount to 5,000 yards. There was only one case each of drunkenness and quarrelling that came to my knowledge.

During most of the time there was a large amount of gambling among the men, and some among the women, with disks and bones.

FUNERAL AND BURIAL CUSTOMS.

Their sepulchers, as far as I can learn, represent five different ages and have, to some extent, co-existed. There are places where skeletons and parts of them have been plowed up or still remain in the ground, and near together in such a way as to give ground for the belief that formerly Indians were buried in the ground and not in regular cemeteries. Such deposits exist at Doswailopsh, among the Twanas, and at Dunginess and Port Angeles, among the Klallams. These graves were made so long ago that the Indians of the present day profess to have no knowledge of the occupants, but believe them to have been their ancestors. They care so little however about the remains that fifteen years ago the land containing bones at Doswailopsh was taken by a white man, and they were told to remove the dead before all traces of the graves were obliterated, but no one went there to do so, nor were they angry when the underbrush of the cemetery was burned and the ground plowed and levelled.

Formerly when a person died, the body was placed in a box which was put in a canoe, and the canoe placed in the forks of two trees and left there. There was no particular cemetery, but the body is said to have been left near where the death occurred. The Skokomish Valley was once, I am told, full of sepulchral canoes. An old resident informs me that the Klallams always buried their dead in a sitting posture, and I am satisfied that the Twanas at least bent theirs up until the knees nearly touched the chin.

The following is an account of a modern burial of this kind which I witnessed in October, 1877: The deceased was about thirty-five years of age and was a widow. Her father took charge, and being an old man there was more of the old Indian style than I ever saw before. She died about 9 o'clock in the morning and at 3 o'clock in the afternoon I was invited to go to the house and hold a religious service. When I arrived she had been placed in a Hudson Bay Company's box, which was only about 3½ feet long, 1¾ wide, and 1½ high. She was much emaciated when she died or they could hardly have put her in the box, even by doubling her so that her knees nearly touched her chin. A fire was still burning where many of her things had been consumed according to their custom. Her mother was singing a mourning song, others joining in it at times, often saying, "My daughter, my daughter, why did you die?" About thirty persons were present and all out of doors, the coffin box being under an old shed. I held a funeral service and returned home, having been invited to go to the grave the next day. About 9 o'clock the next morning they called for me and we went in a canoe 3 miles to the cemetery, two other canoes having preceded us, one carrying the corpse. Sometime previous a medicine man had asked the deceased to become his wife, but she had refused, and he had said if she did so, he would kill her by his "tamanous." This, her friends believed, was the cause of her death, and they compelled him to give the canoe (25 feet long and worth $30) in which she was buried. Four boards of old Indian make, about a foot wide and 7½ feet long, used as posts, were secured in the ground to the depth of a foot and a half. Before being erected a hole was cut in each post 2 feet from the upper end, and 5 inches square, in which cross-pieces were placed for the canoe to rest on. As each hole was cut, and the board laid aside until the rest were ready, a handful of green leaves was placed over it which was allowed to remain until the post was ready to set up, when the leaves were thrown aside. Leaves were not however put on the last board, for as soon as the hole in it was cut, they were ready to set all of them in their places. Two other boxes, which I presume contained many articles belonging to the deceased, or brought by her friends, were placed in the canoe, together with the coffin box, and the whole was elevated to its position and braced. Over the central part of the canoe, a roof of boards covered with white cloth so as to more than cover all the boxes, was placed, and holes cut in the canoe so as to render it valueless for travelling. On the two posts nearest the water the head-board and foot-board of her bedstead (American make) were nailed, and on each of these a dress was fastened. I then said a few words to them and pronounced the benediction, when all went down from the hill to the beach except her father, mother, and brother, who remained for ten or fifteen minutes mourning and pounding on the canoe.

It was now half past 1 P. M., and a little food was given to all, there being twelve men and three women present, after which the father and mother of the departed made presents to all. One man received a gun, two persons a blanket each, and the rest $1.50 each. After this four men made short speeches in their native language which I did not understand.

They said she was buried in this way because she was a prominent woman, and that in about nine months a potlatch would take place very near where she was buried, and that as each tribe should come, a few of their prominent men would be sent to the grave with presents, after which she would be put under ground. The predicted potlatch took place about thirteen months afterwards, but she still remains in the canoe.

Scaffold burial in cemeteries.—Unprincipled white men having stolen many of the canoes in which their dead were placed, induced these Indians to adopt a different mode of burial. Instead of placing them in forks of trees they collected their dead in cemeteries, placing them in boxes or canoes on scaffolds. The ruins of such a grave-yard now remain about 2 miles from the agency, but nearly all the dead were removed some years ago.

In March, 1878, two Twana children, related to one another, died almost at the same time—one was the child of a medicine man. All of the tribe, it is said, were invited to the funeral; about fifty went, but not a single child among them. They went to the cemetery, 3½ miles distant, in canoes, with much mourning. When they arrived at the cemetery the medicine man tore down an inclosure where two of his children had been buried with four other children, relations. Another medicine man, belonging to the same clan, also tore down an inclosure where the bodies of two of his children were placed along with those of two others, their relations. Two of these corpses were above ground and two below. The coffins beneath the ground could not be taken up, but the clothes around the bodies were so well preserved there was no difficulty in removing them. One of the coffins was large enough to hold two children, and other rude boxes were made of such capacity as to admit of twelve children being put into eight of them. In one case it was found impossible to place two of the bundled bodies in the same coffin, whereupon the cloth which was wrapped around one was roughly torn off, a little calico wrapped around the skeleton, and then it was put in with ease.

A large grave was dug near by, about 12 feet long and 5 feet wide and 4 feet deep, lined with mats, and all the boxes and coffins were placed in it, completely covering the bottom of the grave. Several of these boxes were wrapped with many thicknesses of calico, and quilts, blankets, shawls, calico, and a few fancy articles of bead-work and a few small boxes were placed in the coffins with the bodies. All the coffins were next covered with several layers of calico, blankets, mats, and cedar boards to the depth of about 8 inches. An old man then made some remarks, followed by a speech from the child's father, and when this was concluded the grave was filled with earth, a little new calico having been thrown in with the dirt. Next all gathered on the beach, a fire was built on which two or three pieces of cloth were burned, a few men made presents to the fathers of the children just deceased, some calico was given by the women to the mothers, and the two fathers, with another medicine man, presented small sums of money to the men.

RELIGION.

The practical part of their religion is a compound of Shamanism and Spiritism, called in Chinook's jargon tamanous, tamahnous, or tamanamus, and the word expresses their idea so completely that it has been somewhat adopted into English, for the word expresses a combination of ideas for which we have no exact English equivalent. Tamanous is a noun, and as such refers to any spiritual being, good or bad, more powerful than man and less powerful only than God or Satan. Hence the being may be a good or bad tamanous. It is also used to express the work of influencing any of their spirits by incantation. The word is also an adjective, and as such is used to describe any stick, stone, or similar article in which spirits are at times supposed to dwell, and also any man, as a medicine man, who is supposed to have more than ordinary power with these spirits; hence we often hear of tamanons sticks and tamanous men. It is likewise a verb, and to tamanous is to perform the incantations necessary to influence these spirits. In some cases it is done mainly by the medicine men, but in others by any one.

Objects and implements of worship.—I do not believe that these Indians ever had any idea of the Great Spirit before the coming of the whites. They have however a plain idea of a great being, perhaps mythological, who has much to do with the world as it now is, and who is called in Twana and Nisqually Do-ki-batt, and in Klallam Mi-ki-matt. The word means a changer, and considering his work, it is an appropriate name. When he was here he was supreme, and they think he may have a second coming at any time.

Demons.—They firmly believe in the presence and power of malignant spirits, and much of their tamanous is to conquer them and to gain their favor and aid. The chief of these demons, according to the Twanas, is Skwai il, who resides below, but in another place from the disembodied human spirits. Often a parent tells a child, "You must not steal or do wrong; if you do, Skwai-il will see you and take you to his dwelling-place."

Angelic spirits they believe to be constantly around. Every man and nearly every woman formerly was thought to have one which was called his or her tamanous. Such a spirit was supposed to guard the man or woman who often communed with it in the dark, when alone in the woods, and, by various incantations, invoked its aid in time of need. These angels were the most useful deities they had.

Inanimate objects, images, pictures, etc.—They believe that these spirits, both good and bad, may dwell at times in certain sticks or stones, hence these sticks and posts become objects of reverence. The sticks are generally reverenced at all times, for, although the spirit dwells there only a small portion of the time, yet after it has been given to the spirit by its earthly owner that spirit is supposed to always watch over it and be angry with any one who treats it disrespectfully.

Tamanous water.—It was believed that formerly the Klallam Indians of Elkwa possessed a mysterious power over all other Indians; that if they wished to call a person a long distance off, 20, 30, or 50 miles away, they simply, talking low, called him and he came; that if they talked thus about a person, his heart was in a complete whirl, and that if they talked ill and wished to do evil to any one thus distant, his eyes were made to whirl and the evil wish came to pass. The cause assigned for this was as follows: Far up in the mountains at the head of the Elkwa River are basins in the rocks; one of these is nearly full of black water and it is always as full whether the weather is wet or dry. In this water, which is thought to be tamanous, the Elkwa Indians washed their hands and arms and thus, it was believed, gained their dreaded power.

Idols.—The sticks, posts, and the like just described are made by the Indians consecrated to this tamanous, and hence contain the principle of idolatry.

The sun.—An old Klallam man informed me that before the coming of the whites they knew nothing about God, but worshiped the sun as their God and they prayed to it daily, saying, "Sun, take care of me," and they gave food to it at noon. Another Klallam told me that they also believed the sky to be supreme, and that it was a common saying of the old ones to their children, "You must not do wrong or the sky will see you." Such ideas come to the surface but very little in their intercourse with the whites, yet I think my informant spoke the truth, and I quote the following from Swan's "Indians of Cape Flattery" in corroboration: "Every night we wash and rub ourselves with cedar and every morning talk to the great chief or his representative, the sun, whose name is Kle-sea-kark-tl," while the following note is added by Mr. Gibbs: "Among the western Selish or Flathead tribes of the Sound I have not detected any direct worship of the sun, though he forms one of their mythological characters. He is by them represented as the younger brother of the moon." According to Father Mengarini he is, however, the principal object of worship among the Flatheads of the Rocky Mountains or Selish proper, as well as by the Blackfeet. Among both tribes he was supposed to be the creation of a superior being.

Sacred legends.—They have a distinct tradition of the flood which I modify a little from the one given in Eells on the Twanas: "The flood was sent because the people were wicked, and it overflowed all the land except one mountain. The people fled in their canoes to the highest mountain in their country—in the Olympic range—and as the water rose above it they tied their canoes with long ropes made of cedar limbs to the highest tree; but the water rose above them. While they were there some of the canoes broke from their fastenings and floated away, so far that they never returned, which accounts for a few being left in the tribe (Twanas) now."

Ecclesiastical organization.—Medicine men are numerous, and are feared because of the power they are supposed to have with spirits. They demand large fees, and sometimes in advance, for healing the sick. If the medicine man does not consider the amount offered sufficient, he will do nothing until enough is given to satisfy him; but if he fails to heal he gets nothing, and sometimes has to pay the relations of the deceased for his failure. He also receives pay for other work he is supposed to do, such as making a person sick at the request of an enemy. The calling is confined to the men among the Twanas; but at a Twana potlatch a Skwâksĭn woman acted as doctress, and there is at least one medicine woman among the Klallams at Elkwa.

There are no rain makers; but at Eneti there is on the reservation an irregular basaltic rock about 3 feet 4 inches in diameter and 1½ feet high. On one side there has been hammered a face, said to be the face of the thunder bird, which could also cause storms. The two eyes are about 6 inches in diameter and the nose about 9 inches long. It is said to have been made a long time ago by a man who felt very badly and went and sat on the rock and with another stone hammered out the eyes and nose. For a long time they believed that if the rock was shaken it would cause rain; because the shaking made the thunder bird angry. They have now about lost faith in it, so much so that about two years ago they formed a boom of logs around it, many of which struck it. That season was stormy and many of the older Indians said "No wonder, as the rock is shaken all of the time." It is on the beach facing the water where it is flooded at high tide, and the impression is being gradually worn away by the waves.

Finding tamanous.—The first thing for a young man to do in the way of a sacred rite is to get his tamanous. In order to accomplish this I am told that a father would send his son into the woods a long way from home, where he was not allowed to eat or drink during a period of from ten to thirteen days, though he was allowed to bathe often and keep up a good fire. At last his tamanous revealed itself to him in the shape of some animal, either a bird or beast, which was afterwards sacred to him. They think that ordinarily such fasting would kill a man, but that he is kept alive by his tamanous.

Using tamanous.—After this the Indian tamanouses for what he wishes very earnestly on somewhat the same principle that the Mohammedan prays. Hence they tamanous for wind, for gambling, and to cure the sick or cause sickness.

A wicked medicine man can, as they believe, in an invisible manner shoot a stone, ball, or poison into the heart of a person to make him sick. They believe this so firmly that they say when the heart of one who died was opened the stone or bone has been found in it. He is also supposed to be able to send a woodpecker, squirrel, bear, or any treacherous animal to the heart of his enemy to eat his heart, plague him, make him sick, or kill him. The good medicine man finds out from his sickness what kind of an animal it is and then tries to draw it forth, and while the common people make a noise, pounding on a rough drum, on sticks, halloing, singing, etc., the medicine man places his hands on some part of the body and draws forth, or says he does, the evil spirit, and when he says he has it he holds it between his hands, invisible, and blows it up or takes it to another man who throws a stone at it and kills it. When the sick person is not cured they say there are several evil spirits, but sometimes the person dies before they are all drawn out or else the opposing medicine man is stronger than he and so he can not draw them all out. Sometimes the good spirit of the person is gone and he is sick. Then the medicine man draws them all out. Sometimes the good spirit of the person is gone and he is sick. Then the medicine man tries with his hands to draw it back and so cure him.

The first time I ever saw an Indian doctor perform over a sick person was in October, 1876. The patient was a woman of perhaps fifty years. As I went to the house a prominent Indian came out and told me that although they had sent to the agency physician for medicine, yet they were not certain where she was sick. At times she could not see, she would know almost nothing, and could not tell where she was sick, and they were tamanousing to find out what was the difficulty, and when they had learned this they would send and obtain the right kind of medicine. They say that they often do tamanous, first in order to learn what is the difficulty and afterwards to cure. Having asked permission, I went in and took my seat, as directed, behind the doctor, so that he was between me and the patient. The house was about 20 feet square, a summer house, built on the gravelly beach of the Skokomish River. There were about fifteen persons in the house, both men and women, all of whom while the doctor was performing beat with small sticks on larger ones and sang in regular time. I was in one corner of the house, the patient (female) in the opposite corner facing me, sitting up and held by another woman. There were two fires near the middle, and the doctor was between them on his knees on the gravel. He was stripped to the waist, having only pantaloons and boots on, and faced the woman. He had a small tub of water near the woman. As he began he almost laid down on the gravel and sang and kept swinging his head up and down, constantly singing, while the other Indians joined in the singing for about twelve minutes, when he began to vomit violently over himself and the ground. Then came a rest of a few minutes, when he rested and washed himself off. But soon all began again, when he worked up to the woman and, as near as I could see, placed his mouth on her chest or shoulders and sucked very strongly and then blew out of his mouth with all his force, making a great noise, sometimes blowing into the air, always remaining on his knees. This was kept up about fifteen minutes longer, when I left during another respite. But this was neither the beginning nor end of the tamanous. Sometimes they kept it up for most of the day and night or longer. The agency physician said she had disease of the brain, but at no time was very dangerously ill. He afterwards attended her very faithfully, and the Indians tamanoused as faithfully, and she recovered. The following account was given me by a school-boy in regard to his brother:

"When I was at the Indian doctor's house they tamanoused over my brother, for that is the reason my parents went to his house. First, he learned what was the kind of sickness. The doctor took it and soon after that my brother, about nine or ten years old, became stiff and while I sat I heard my father say that his breath was gone. I went out, for I did not wish to see my brother lying dead before me; when I came back he was breathing just a little but his eyes were closed; the doctor was taking care of his breath with his tamanous and waiting for more persons to come, so that there should be enough to beat on the sticks when he should tamanous so as to learn the kind of sickness. Then he went on and saw that there was another kind of sickness besides the one he had taken out and it went over my brother and almost immediately killed him. The doctor took it and travelled (in his spirit) with another kind of temanous to see where my brother's spirit was; he found it at Humhummi (15 miles distant), where my parents and brother had camped in a recent journey. So my brother became better after a hard tamanous.

"There is a class of persons which we can not see; they are poor looking persons; they take young people from these and other Indians; when they take a certain person that person always gets crazy. Another brother of mine heard their dog barking; the people thought it was from some white people, but there was no white man near and they knew it belonged to these people."

I once witnessed a performance which I have been inclined to call a silent tamanous. I was camped with five canoes of Indians one night in February, 1878, one of our number being a medicine man; after supper some water was poured into a bowl not far from a woman who I had not learned was ill, but she must have been ailing a little; she was sitting perhaps 10 feet from me. The doctor went to the bowl but no one else seemed to take any notice of it; the woman's husband went away. Another woman lay unconcerned in the camp, it being a half-circle mat house, and other Indians were about, but they did not come near; there was no noise or singing, or pounding on sticks or drumming; the doctor put his hands in the water, warmed them a little, and then placed them on the woman's side, her dress having been opened and partly taken down for the purpose, and he acted as if he were trying to draw out something. This was done a second time, when he plunged them into water, placed his mouth next to them and blew suddenly and powerfully a few times; this was done two or three times, when he left, the performance being ended.

Tamanousing for lost souls.—Sometimes before a person dies, it may be months, it is supposed that a spirit comes from the spirit world and carries away the spirit of the person, after which the person wastes away or dies suddenly. If by any means it is discovered that this has been done, and there are those who profess to do it, then they attempt to get the spirit back by a tamanóus, and if it is done the person will live. Sometimes a person who has much intercourse with the other world persuades one who is in the best of health that he has visited the spirit land and seen the spirit of his dupe there, and the latter is thus frightened into having a tamanous. Again, when some credulous individual has been ailing a little for a long time, but not sufficiently to feel that he needs to employ a medicine man, one of these arrant humbugs takes a fancied journey to the land of shades to search for the lost soul of the invalid, the discovery of which he soon announces, and once more there must be a tamanous. Frequently in the winter when time hangs heavily on their hands and they are at a loss for amusements these soul searchers pretend that they have received tidings of a number of errant spirits and they get up a general spirit hunt.

In January, 1878, a tamanous of the last kind took place among the Twanas, and I learned the following facts concerning it from one white man and some school-boys who were present:

The performance is carried on mostly in the night, as it is said that day-time with us is night-time in the spirit world, and *vice versa.* The breaking of the ground is an important part of the ceremony. The surface of the earth is often actually broken in order, they say, that the spirits of those who are performing can descend into the other world. When, as they pretend, the descent is accomplished, they represent pantomimically that they travel along a road, cross at least one stream, and travel on until they come to a place where the spirits dwell. These they surprise and engage in fight (a great noise is here kept up by all present), and having captured they bring back to this world the spirits of three persons which they pretended to roll over up in cloth and work for some time, after which they seemed to give them to their real owners. When they put the spirit of one man on him, he sang his tamanous song, and when a medicine man received his, he cried very much. Only men enact the part of travellers in the nether world, although women and children are present at the tamanous. When they are supposed to cross the stream they actually set up some boards against opposite sides of a beam in the house which is about 10 feet from the ground, thus **A**, to represent the bridge. They crawl up the board on one side and down the other. If, in going down, a man slips they believe he will die within a year. Several years ago it is said a man did slip on such an occasion, and as he died within a year they are convinced of the truth of this belief. Only eight men went through this journey at one time, but the rest of the numerous body in attendance pounded sticks and sang their tamanous songs to the accompaniment of the drum.

While performing they danced with the hand sticks around the idol. They also wore the head-band. The house in which this took place was built the previous season for this purpose, and was similar to the large dwelling-house. I am told that when they are professing to fight with the underground spirits and conquering them they break through the sides of the house, which are not very strong, and run outside accompanied by all the spectators. At times they also profess to bring berries from the other world, and if so, the bushes in this world will bear abundantly the next season.

Black tamanous rattle.—In the black tamanous a hollow rattle is used. To make one pieces of wood are carved and hollowed, small stones or shot are placed between them, and they are fastened together with bark at the handle and strings at the sides. Such rattles are usually painted black, and are shaken in the hand with a circular movement. They are not now used by the Twanas.

Purification.—When a young man went forth to obtain his tamanous he washed himself, much as already described, this cleansing being very essential. A Klallam doctor told me that the children, if they wished to become strong tamanous men, were accustomed daily, both summer and winter, to bathe, remaining in water a long time, sometimes, he said, for hours, supposing they thereby gain the favor of the tamanous. He said that he did so when young.

BELIEFS.

Dreams.—The following story of a dream was told me by the medicine man who dreamt it: A child of his died and he felt very sorry about it, crying much of the time. One night he went to sleep and dreamed that some one came to him, similar to the picture of an angel which I had shown him, and took him off to the other world, leading him at first by the finger-nails. They went till they came to where the roads forked, one going up towards the good land and the other downwards. He was led in the lower one where there was no fire and where it was very dark. A tree or stick stood between the two roads, and his leader jumped on it and thence to the upper road and laughed at him, saying he could not jump so, but if he did try he could not get into the good road and go to his child. He however made the attempt, and in two jumps reached the upper road, and they went up until they came to a house, at which his leader knocked. They were admitted, but there was no one in the house save an old man, who told them that the child was farther on. They proceeded until they came to a prairie where was excellent grass and some sheep, which were very lean and did not eat. Next they came to a barren land where were some fat sheep, and again to a good grass country with lean sheep. After a time they reached a hill where were some children and persons singing, and his leader told him that his child was among them, but that he must not go over the hill and see the child. The spirit then gave the dreamer some maple leaves and huckleberry leaves, telling him that the maple leaves would be a girl and the others a boy, as children for him. He was also told that he must not cry for his child as he now knew that it was safe, and that he must not cry for other friends, as his wife or mother, if they should die; but if he felt very sad he might cry for three days.

The man says that since that time, when a friend of his has died, he only mourns for three days. His leader also told him that this world would come to an end in three years.

Snakes.—There is a tradition among the Twanas that a long time ago they were not afraid of snakes, but that one man killed several, and at last killed the king of snakes. Then all the small snakes gathered together and attacked the man, fastening themselves to his mouth, eyes, ears, nose, face, and in many other places, and bit him, and killed him, and now they are afraid to kill or even approach a snake.

Future existence.—Their belief was that the next world was neither above or below, but somewhere within the earth. There was only one place for all; both good and bad.

Incarnation.—The tribes under consideration, as well as the others in this region, have a tradition that a great being called the changer went all through this region and did many wonderful things. Whether this be a dim tradition of the incarnation of Christ, or not, I can not determine; but I have thought it might be. When the Indians first heard of Christ they associated him at once with the changer, whom they said they believed to be the great Creator. When I have been teaching them about the coming of the Savior they have said they always knew of this, and have repeated some of their legends about the changer, our God and this mythical being having the same name in the Chinook jargon, Saghalie Tyee, but in the native language they have different names.

God is called, in Twana, Wĭs-só-wul-us; in Nisqually, Shuk-si-ab; and in Klallam, Tsĭlt-si—all of which, as well as the Chinook, Saghalie Tyee, means the above chief, while the changer is called by the Twanas and Nisquallies Do-ki-batt, and by the Klallams Nu-ki-matt.

The following are the traditions concerning him:

Klallam traditions express some uncertainty as to who this being was, but they usually consider that it was a woman who came from the south and changed human beings into lower animals and inanimate objects. Protection Island, at the mouth of Port Discovery Bay, was once, they say, a part of the main-land, and it and the main-land were a man and his wife, but the man became vexed with the woman and kicked her away, and when Nukimatt came she changed them into land as they are now.

The mountain back of Freshwater Bay, about 9 miles west of Angeles, was, according to tradition, a woman, and Mount Praher, in British Columbia, was her husband, both living near Freshwater Bay, while the large rock off the cape at the western end of the bay was their daughter. The woman was bad and abused her husband; he bore it for a long time, but at last took his things, put them in his boat, and went across the Sound to where the mountain now stands. When Nukimatt came she changed them all into what they now are.

One Klallam has told me that they supposed that the sun was the creator of the world and that when Nukimatt came she was the sun incarnate. Another name for her was I-nach-tĭn-ak.

Dokibatt, the Twanas say, was the creator of all things, making birds beasts, and all lower creatures before he made man. According to one Indian he made the moon and sun, the moon first and in the night, intending it to be the sun. In the morning it rose, but it shone too hot and caused the water to boil, killing the fish and also many animals on land, and did much damage generally, so then he made the sun as it now is to rule the day, and condemned the moon to shine at night. This tradition differs only a little from one given in Eells on the Twanas. He created man out of the ground and a woman out of his rib and gave them a good land, telling them they might eat of all the fruit except one kind of berries. But the woman, tempted by the king of evil spirits, Skwai-il, ate of those berries, and when Dokibatt came he said, "Have you been eating of those berries?" She said "No." He replied, "Yes, I know you have." On account of this they think that her children became Indians, ignorant, foolish, and dark-skinned. But the man did not eat of the berries, and to his children were given letters, the knowledge of books, and a white skin.

A long time after this Dokibatt came again to this world because things were not good, and rectified them by changing them, hence his name, which means a changer. The man, knowing that Dokibatt was coming, sat down and began to whet his knife on a stone, saying, "I will kill Dokibatt when he comes." Soon he came and asked the man, "What are you doing?" "Nothing special," was the reply. Again the same question was asked, with the same reply. Then Dokibatt said, "I know what you have said; you want to kill me. Let me take your knife." He took it and felt of its edge; it was very sharp. He plunged it into the leg of the man up to its handle, when the man began to jump, and jumping away became a deer; and that knife slightly sticking out is still seen in the legs of the deer (the small part behind, as I understand). Acting similarly with his knife he was changed into a beaver, his knife becoming the tail.

Another person was pounding against a cedar tree, and Dokibatt asked him what he wished to do. The reply was, "To break or split the tree." Dokibatt said, "You may stop and go away and I will help you." As the person went wings came to him, also a long bill and a strong head, and he became the woodpecker.

A boy who knew that Dokibatt was coming to make great changes was in mortal fear, as he did not wish to be changed; so he began to run away, carrying with him a water-box with some water in it; but as he ran wings came to him and he began to fly. The water shaking sounded something like pû-pû-pû repeated rapidly, and the sound was changed into the present noise of the bird as it begins to fly. So the dove then began its present mourning cry, "hûm-ó-hûm-ó." And the Twanas to this day call the turtle-dove "hûm-ó."

Other men had painted themselves in various ways, and when they were changed the colors partially remained; hence the different colors of various birds.

About a mile above Sĭlanwofs are two large impressions in the basaltic rock, somewhat similar to large foot-prints, 2 or 3 inches deep. These, they say, are his tracks. They are between high and low tide, and were evidently formed by the water.

At Skwaksin a man was crying, and the tears running down his face he was changed into a stone, and the lines of tears are lines on the stone, still visible.

He taught them how to catch fish, how to make the fish-traps, and when to fish.

He went to all lands, gave to each tribe their language, and to some tribes special kinds of food. To one tribe he gave crows, to another a special kind of fish, and to one beyond the Cascade Mountains snakes. He came from the south or west, where they suppose the sky comes down to the earth, as it appears to do, and that is his dwelling place. He came once to create, a second to change, and will come again to make the world over again when it becomes old.

ANCHOR STONES.

By B. F. SNYDER, M. D., *of Virginia, Cass County, Illinois.*

In the study of American antiquities we meet with many objects of pre-historic art that baffle our comprehension, for the reason that we are ignorant of many of the methods of life and the superstitious observances and religious rites of the ancient people who wrought them. Of this class the so-called "plummets," "discoidal stones," "gorgets," "amulets," and "banner stones" are mysteries to us, because their original purpose is unknown, our civilization admitting of no use or necessity for them. The names we have assigned to them are sometimes misleading, and even the uses to which recent Indians have applied them can not be relied upon as correctly indicating their true design. Thus, Adair, Lawson, Timberlake, and others have described the game of *Chungke* which they saw played by the Mandans, and by the Cherokees, Creeks, and other Southern Indians, with discoidal stones; but neither they nor any other white persons have ever seen an Indian *manufacturing* a discoidal stone; and because recent Indians utilized them in their games, it is by no means conclusive that they may not have found them already made, as we do, or that they were not as ignorant of the specific service for which their remote ancestors made them as we are.

But, on the other hand, it is reasonably certain that many of the ways and means of obtaining subsistence employed by the earlier aborigines were identical with those practiced by the Indians here who first met the invasion of Europeans and sullenly receded before it. In securing food by hunting and fishing all primitive people, the world over, yet unacquainted with the use of metals, resorted to very much the same arts and appliances. The bow and stone-pointed arrows and spears, bone fish-hooks and harpoons, rude traps, nets, and seines were the inventions and contrivances alike of peoples widely separated and unknown to each other. To savages who had progressed so far as to venture upon the water, on rafts or in canoes for catching fish, the necessity of remaining stationary while so engaged would soon become apparent, and the means for accomplishing this would naturally suggest the employment of some heavy substance resting on the bottom of the lake or stream as an anchor. A stone would the most readily and conveniently supply this want, and almost anywhere along the shores of our rivers and lakes stones of requisite dimensions for such use could be easily obtained. Rough stones, demanding no labor for their preparation, were probaby so used since the first canoes were launched. Taken from the nearest point when needed, they were cast aside at any place when no longer wanted, bearing no mark or sign of their service. In some instances the same stone was repeatedly used as an anchor during the fishing season, and received from the fisherman some modification of form to better fit it for its office, and in a few exceptional cases the anchor stone was completely and artistically fashioned from the rough, angular rock. In one respect the aboriginal American did not materially differ from a numerous class of his civilized successors; he had no especial fondness for manual labor. Consequently, it is not surprising that he expended so little work on his stone anchors when he found them to answer his purpose as well or better without it.

Of the very few *manufactured* anchor stones, presumably of pre-historic date, of which we have any account, I have been so fortunate as to secure a fine specimen, which is figured on page 194 of the elaborate monograph on Prehistoric Fishing, by the late learned curator of the department of antiquities of the Smithsonan Institution, Dr. Charles Rau, accompanied by a brief description of it by myself in a note I addressed to the author. Before reproducing that description here I will describe the first specimen of the kind that came into my possession, and which was also mentioned in my note referred to.*

This anchor stone, represented by Fig. 1 (accompanying Plate I), I stated to Dr. Rau, was "apparently natural in its form; a smooth, water-worn river rock, etc." A subsequent careful inspection of the stone proves this statement to be not altogether correct. By attrition and the force of water currents it had probably approximated its present shape in general outline; but it is plainly to be seen that its smooth, rounded edges and uniform surfaces have been wrought with patient labor guided by consummate skill. There is little doubt that this stone was designed to serve a double purpose; or, having been made for a specific use, in which it did duty for a time, was afterward converted, by cutting the groove across it, into a canoe anchor. In diameter it is 12 inches, in thickness 2½ inches, and weighs 26 pounds. It is nearly circular, and its surfaces are concavo-convex; the one side convex to the extent of rising in the center three-fourths of an inch above the plane of its circumference, and the other side has been hollowed out to a corresponding depth. Across its face and over the edges a groove has been cut an inch and a quarter wide, but not deep; sufficiently deep, however, to clearly indicate its use—or one of its uses—as an anchor. It is a white, crystalline limestone, from one of our local carborniferous strata that crop out in many places on the Illinois River. But for the vertical groove in this specimen it would not differ materially from many others found here and

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* Prehistoric Fishing, pp. 194, 195 (Smithsonian Contributions to Knowledge, Vol. xxv).

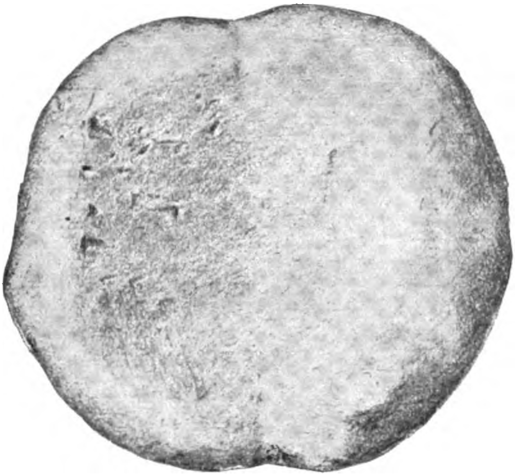

FIG. 1.—(⅓.)

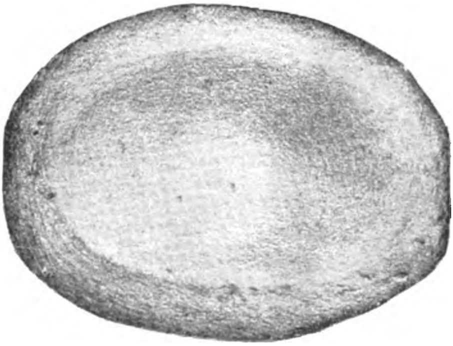

FIG. 2.—(¼.)

elsewhere in the Mississippi Valley, having on one side, and sometimes on both, shallow, basin-like depressions artificially scooped out. Stones of this character are found of various dimensions and different kinds, and are commonly known as "mortars," the general belief being that they were used in some inexplicable way for grinding grain with the aid of pestles, somewhat as the *metate* is still employed by the Pueblos and Mexicans. Fig. 2 (Plate I,) represents a typical specimen of the objects mentioned, now in my collection. It was found near the bank of the Illinois River in excavating a cellar in the city of Beardstown, in this county, on the site of an ancient Indian camping ground. It is a smooth, water-worn bowlder of hard greenstone (diorite), with both sides hollowed out dish-like to the depth of almost an inch at the center below the edges. It weighs a fraction over 15 pounds, is 9½ inches in length, 7 inches wide, and 3½ in thickness at the circumference; with rounded borders smooth, excepting at both ends, and on one side for a space the stone is roughened and battered as though it had been used as a maul for breaking other stones, or as an anvil upon which hard substances had been hammered. Fig. 3 (Plate II) is another so-called mortar of the class most frequently found, from one of the counties in the southern part of this State (Illinois); a rough block of granite weighing 16 pounds, with smoothly-worn depressions on both sides. The excavations in all the objects of this class, including Fig. 1, are so insignificant, so shallow and broad, as to preclude their supposed use as mortars. "Dished" stones of this character are comparatively common in southern Illinois and farther east on both sides of the Ohio River. And in the same territory stone mullers, of which Fig. 4 (Plate II) is the ordinary type, are also frequently met with. The correlation of the two implements is a natural inference at first sight, but the experiments I have tried with those in my collection satisfied me that the two implements were not used together. I could find none of the pestles to fit the mortars. The pestles have broad, flat bases not adapted to concavities, and must have been used, if used as *pestles* at all, on plane surfaces, as our painters of a generation ago employed similar stone mullers for grinding their paints on broad, flat slabs of marble. The "dished" stones, in my opinion, are simply the rubbing-stones, or whetstones upon which, with the aid of sand and water, the diorite axes and celts received their cutting edges.

The anchor stone I was describing when led into this digression was found in a small sand mound, 15 feet in diameter and 2 feet high, a short distance from the Illinois River, in the suburbs of the city of Beardstown. The mound covered the much-decayed skeleton of a large, middle-aged individual, who had been laid on the surface of the ground, on his back, at full length, with feet to the west and arms extended down his sides. The back of the skull rested in the concavity of the stone, which had been placed as a pillow under the occiput of the corpse. Under each shoulder and under each elbow, each hip and each heel of the skeleton, was found a common, smooth, water-worn pebble, of the average size of a hen's egg; in or near one hand, seven flint arrow points; and in or near the other hand, three large scales of the alligator gar—that perhaps had also served as arrow points—completed the sepulchral deposit.

My second anchor stone, Fig. 5 (Plate II), the one figured in Prehistoric Fishing, was brought up from the bottom of the Illinois River, half a mile below the confluence of the Sangamon, by one of the Government boats employed in improving the channel for navigation. It is of compact, yellow sandstone, the most prominent rock of the coal measures underlying the Sangamon and Illinois bluffs in this county. It weighs 34½ pounds; is symmetrically proportioned; circular in contour; 12 inches in diameter by 6½ in thickness at the center, with neatly rounded edges, and is encircled by a groove, 1½ inches wide and three-fourths of an inch deep, cut across the face equally on both sides. The surface of the stone is not smooth, but presents the appearance of having been "bush-hammered"—to use a term of modern stone-cutters—the result of pecking with sharp-pointed flints or other hard stones. The groove around it is regularly and skillfully cut, and shows throughout the pitting of the pointed stone instrument that shaped it.

Not long after the recovery of this anchor stone the dredge brought up another one from the bottom of the river, at a point 2 miles farther down stream, that was almost an exact copy of the one I have just described, in material, dimensions, and form. Unfortunately it escaped the notice of any one capable of properly appreciating its value, and fell into the possession of an ignorant German who at the time was employed as a laborer on the boat. His estimate of this interesting nautical relic was more practical than scientific; and carrying it to his home he there utilized it as a weight in the family kraut barrel that stood in a corner of his kitchen. In this ignoble service I found it and attempted its deliverance; but, suspicious that my desire to obtain the stone sprung from a secret knowledge of some extraordinary intrinsic value it possessed, neither price nor persuasion would induce the kraut-eating plebeian to part with it, and I sadly left it in its vulgar obscurity. Before another opportunity was presented for renewing my efforts to secure it the Teuton's hovel was accidentally destroyed by fire, and the much-coveted anchor stone was shattered in fragments by the intense heat.

A few years later, in the same locality, I discovered another anchor stone near the door-step of a small farm house at the foot of the bluffs on the west side of the Illinois. The farmer, who was also a fisherman, found it at the river's edge at low water, and, noticing its peculiar shape and surface marks and the encircling groove, he was intelligent enough to recognize it as as "Indian relic" and mercenary enough to hold it for a good price. This stone anchor had not been finished when it was lost or abandoned by its ancient owner. The rough angles of the rock had been pecked away and rounded with sharp flints and the block reduced to an irregular oval, as shown in Fig. 6

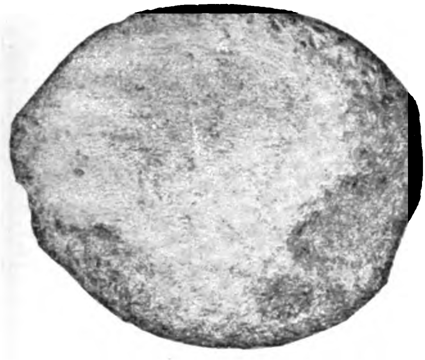

FIG. 3.—(⅓.)

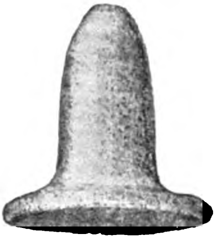

FIG. 4.—(½).

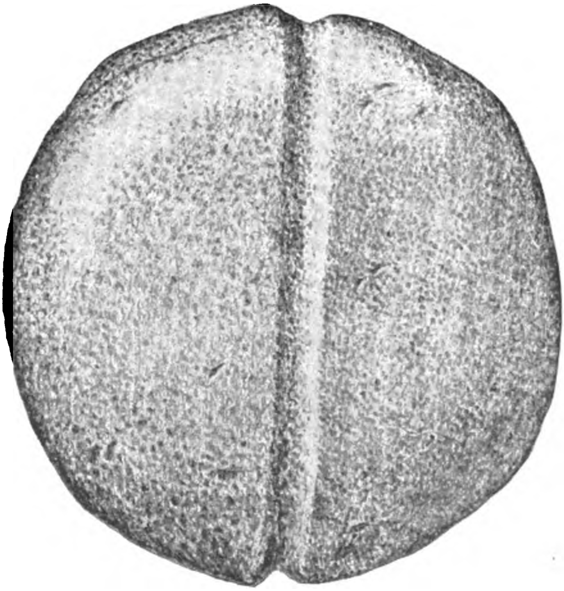

FIG. 5.—(¼.)

(Plate III). The groove around it is not completed, but cut sufficiently deep to securely hold the anchor line. It is of the same yellow, massive sandstone from which the two last-described anchors were wrought. It weighs 43 pounds; is 12 inches in length, 10½ inches in width, and 6 in thickness. This stone, like Fig. 1, had served in more than one capacity. Though in general contour each side approaches regular convexity, there is in the middle of each surface a slight, saucer-like depression worn on the side shown in the cut, perfectly smooth; but on the reverse side the hollow is rough and incomplete. The stone bears all over, excepting in the front depression, the pitting marks of the sharp-pointed flints used in its reduction.

The extended researches of Dr. Rau throughout both hemispheres* in the arts and artifices employed by primitive peoples for catching fish, with all the facilities afforded him by the Smithsonian Institution and his mastery of several languages, have brought to light a very limited number of *wrought* stones designed to serve especially as boat anchors. The conception of making an anchor of a rock was as natural to savages unacquainted with metals as was the expediency of making weapons and tools of stone; but as the rocks in their natural condition were the most efficient as anchors, it is difficult to comprehend why so much labor was expended in cutting any of them to prescribed patterns for this service. The sculptured rounded anchor stones perhaps were port of the equipment of bark canoes, so thin and fragile as to be endangered by carrying rough stones heavy enough to answer as safe anchors; hence cutting down projecting points and angles became necessary as a precautionary measure to guard against accidental scuttling of the craft. If this explanatory suggestion is rejected as improbable or inadequate, we must then ascribe the exceptional flint-chiseled anchor stones to the esthetic element inherent in the Indian. In point of age there is little doubt that these interesting relics ante-date the advent of Europeans. They are certainly the product of Indian art, for the negative reason, if no other, that white men had no incentive and were under no necessity for wasting so much useless labor on such objects. "Stones are still employed," remarks Dr. Rau,† "instead of anchors for small craft in Europe as well as in North America, and probably all over the world. With regard to North American anchor stones, therefore, some discrimination is required to discover whether an object of this class is a relic of the former inhabitants or of their white successors, and there may be cases in which a proper distinction becomes well-nigh impossible. Our fishermen on the great lakes and rivers almost universally use stones in lieu of anchors."

In this respect there can however be no uncertainty as to the antiquity of my first specimen, Fig. 1. Its inhumation with the body of the fishermen who probably made and used it, and its association in the mound tumulus with flint arrow points, are sufficiently conclusive.

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* See Prehistoric Fishing, Washington, 1884.

† Prehistoric Fishing, p. 195.

(Plate [illegible]. The groove around [illegible] ciently deep to securely hold the [illegible] massive sandstone from which [illegible] wrought. It weighs 43 pounds; [illegible] width and [illegible] in thickness. This stone [illegible] than one [illegible]. Though in general [illegible] regular [illegible], there is in the [illegible] over the depression worn on the side [illegible] but on the reverse side the hollow [illegible] bears all over, excepting in the front [illegible] the sharp-pointed flints used in its [illegible]

The extended researches of Dr. Rau [illegible] in the arts and artifices employed by primitive [illegible] fish, with all the facilities afforded him by the [illegible] and his mastery of several languages, hav[illegible] limited number of *wrought* stones designed [illegible] anchors. The conception of making an anc[illegible] to savages unacquainted with metals as w[illegible] weapons and tools of stone; but as the [illegible] were [illegible] the most efficient as anchors, it [illegible] mo[illegible] labor was expended in cutting a[illegible] for [illegible] service. The sculptured [illegible] port [illegible] the equipment of bark can[illegible] dang[illegible] by carrying rough ston[illegible] anchor [illegible] hence cutting down [illegible] necess[illegible] as a precautionary me[illegible] tling of [illegible] craft. If this exp[illegible] able or i[illegible] adequate, we mus[illegible] anchor s[illegible] es to the estim[illegible] of age th[illegible] is little dou[illegible] vent of E[illegible] peans. Th[illegible] the negati[illegible] reason, if [illegible] were under [illegible] no necess[illegible] jects. "Stones are still employed [illegible] chors for small craft in Europe [illegible] ably all over the world. [illegible] therefore, some discrim[illegible] of this cla[illegible] cessors, [illegible] well-nig[illegible] most u[illegible]

In th[illegible] *tiquity* [illegible] the fis[illegible] the mo[illegible]

But with the others their claim to pre-historic origin rests more on presumption and assumption than upon positive evidence. They were sculptured in symmetrical form from rough blocks by precisely the same method employed by pre-historic makers of stone celts and grooved axes, who reduced fragments and small bowlders of igneous rocks to the required shapes of finished implements by pecking them down with pointed pieces of flint or quartz. Of all the stones used as anchors in the historic period (of North America) there is not an instance recorded of one of them having been wrought throughout by this method. But stones are at this day *modified* by the pecking process for use as anchors by Indians, and it may be, by whites also.

A few summers ago my collection was visited by Dr. W. H. Daly, an eminent physician of Pittsburgh, Pennsylvania, as he was returning from one of his annual hunting and fishing excursions, this time to the northern lakes. The anchor stones attracted his notice, and he told me that a few days ago he had seen quite a number (fifty or more) "stones like those, with grooves cut around them," scattered along the lake shore near the town of Bayfield, in Wisconsin. Here indeed was a revelation; enough anchor stones to stock all the museums of our country. I lost no time in writing to a friend at Bayfield, and the correspondence in due time fructified in my receipt of two of the anxiously expected objects, one of which is represented by Fig. 7 (Plate III), accompanied by a brief account of them as follows: "The stones you inquire about, two of which I to-day express to you as requested, are not prehistoric, but very recent. They are the common water-worn bowlders of primitive rocks found everywhere on our lake shores by thousands. The Indians (Chippewas) living up north come down here every spring to fish, and use these stones to anchor their bark canoes while fishing near the lake shore. As the bowlders are quite smooth, and mostly round, the fishermen have to cut grooves around them to hold the anchor lines. This they do very quickly and expertly by pecking the groove out with sharp-pointed pieces of quartz and other hard rocks. When they get done fishing here they leave these grooved bowlders on the shore for use again the next spring. Some are lost by rolling into the lake and others are carried away by floating ice; so they have to be replenished by making new ones every year." Fig. 7, I was assured, was fairly representative of the entire lot. It is a polished bowlder of dense, bluish trap, weighing 32 pounds, and is 11 inches in length by 9½ inches in diameter at the middle. The groove is an inch wide and three-fourths of an inch deep, and presents the same pitting that marks the entire surfaces of Figs. 5 and 6.

On receiving the grooved bowlders I immediately wrote to my lamented friend, Dr. Rau, giving him a minute description and drawings of them, and inclosing a copy of the foregoing letter. But his Prehistoric Fishing had then passed through the press, and he answered: "What a pity that your valuable discovery of modern anchor stones came *post festum*."

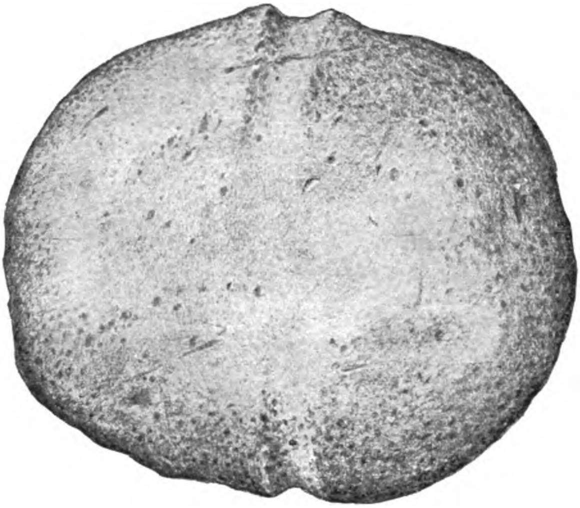

FIG. 6.—(¼.)

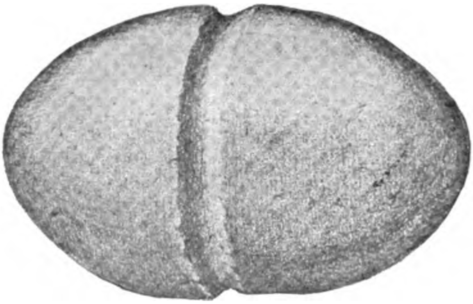

FIG. 7.—(⅓.)

ANTIQUITIES IN MEXICO.

By S. B. Evans.

The town of Tezcoco in Mexico, though uninteresting in general appearance, contains within its limits and vicinity several large mounds, one of which is reputed to be the site of the palace of Nezahuyucoatl, and upon it is a female chapel. An Indian is the owner of one of the *tloletes* or mounds and in leveling the base or lower terrace on the western side, for the purpose of increasing the area of his kitchen garden, he recently encountered a large stone which interfered with his plans and set him to work clearing off another portion of the mound. Hearing of this stone, and obtaining permission to lift it from its resting place, I found it to be a section of an ancient monument of porphyry, sculptured in bas-relief. It is 8 feet in length and 6 feet 9 inches at the greatest diameter, the sculpture representing a colossal human figure, a portion of which is visible on this fragment. It appears that it was broken off at the neck and divided down the trunk to the hips, leaving intact the left side, the arm, and a calendar beneath the arm 2 feet in diameter. The left hand is shown with palm turned inward. The calendar, which is near 6 feet in circumference, is provided with an index, which points to a certain place on the dial, indicating probably the time of the dedication of the monument. The surface of this stone shows marks of violence, as is indicated in the drawing (Fig. 1), given on the following page.

There is a gorget on the neck, a decoration on the breast, and hieroglyphics on the arm, representing, according to Mexican authority, phases of the moon. Upon the index of its calendar is a well-defined Maltese cross. The pedestal of this monument was perhaps in the temple, built on the summit of this mound, from which it was hurled by the Spaniards at the time of the conquest.

The mound was about 60 feet in height and had three terraces or stages, traces of which are to-day plainly perceptible.

It is probable that the Tezcoconians whom Cortez found here were the sculptors of this monument. They, as well as the Aztecs of Mexico, were but a wandering tribe of barbarians three hundred years previous to the advent of the Spaniards. They entered the valley in the beginning of the thirteenth century and settled on the eastern border of the lake opposite Mexico. The descendants of these people live in the vicinity of Tezcoco to-day and for three hundred and sixty years have been in contact with European civilization without having acquired much knowledge of civilized arts. They are still the Indians whose highest works of art are the feathered pictures which their ancestors made at the time of the invasion.

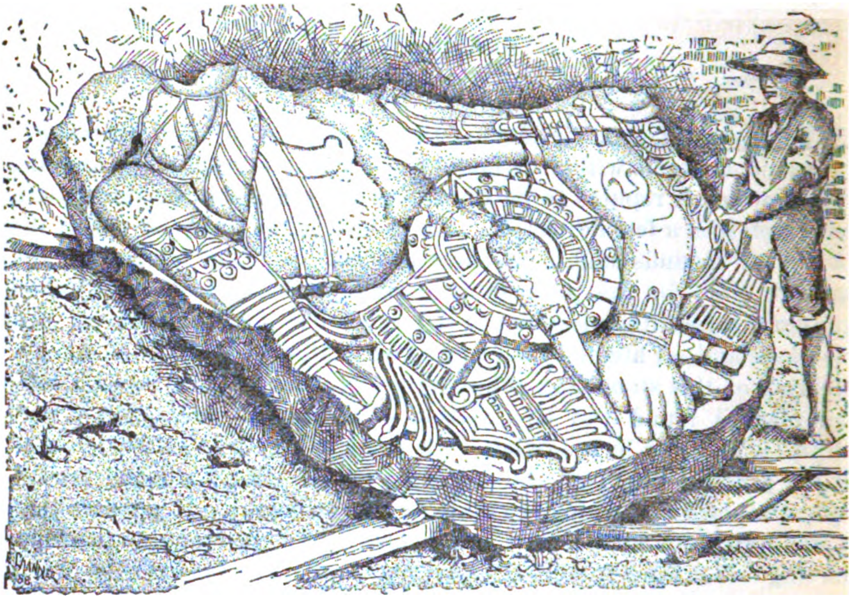

FIG. 1.—Fragment of sculptured porphyry.

If these Indians, whom Cortez found in possession of the soil, were not the authors of these monuments, who did make them? It is quite the fashion to ascribe to the Toltecs everything which is not understood and about which there is a doubt; but there is a grave doubt as to the Toltecs themselves and as to the time when they occupied this valley. It is certain however as to the date of occupation of the Aztecs. It is certain, too, that Tenochlitlon or Mexico was their highest achievement in art or architecture, and Mexico at the time of the conquest, instead of being such a city as Prescott pictures it, was but a collection of mud houses. There were no palaces and there are no remains of palaces in the city of Mexico. Wearied with wandering, the Aztecs finding the remains of a civilization adapted themselves to it the best they could, adopting the idols and blending the religion of the people who preceded them with their own rude idolatry. This is perhaps the cause of the strange contradictions in Aztec remains. In no other way can we account for the defacement of the so-called sacrificial stone by the cutting of a rude channel through its finely sculptured surface, in which the blood of victims flowed in honor of the fierce Aztec deities. The same theory will also account for the presence of such a work of art as the sculptured slab of Tezcoco in the midst of a collection of mud huts, such as Cortez found and dignified with the name of a city.

The drawing of this "find" (represented in the foregoing figure), was made by Mr. W. H. Bishop, and the following is the translation of the certificate of discovery issued to me by citizen Eugenie Villadosola, political chief of the district of Tezcoco, in the State of Mexico, June 3, 1882:

I certify that Señor S. B. Evans, chief of the expedition sent by the director of the newspaper called the Chicago Times, has presented himself in this town for the purpose of examining the ancient monuments that exist in this district which is under my direction, and having discovered in an excavation that had already been begun a stone that is said to be the ancient calendar stone of Tezcoco, the dimensions and drawings of which he has in his possession, I hereby issue to said Señor Evans this certificate of discovery this 5th day of June, 1882.

EUGENIE VILLADOSOLA,
Political Chief.

ANTONY CÆSAR,
Clerk.

The monument, by order of Señor Mendoza (since deceased), director of the national museum at Mexico, has been removed to the city.

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